AN INVESTIGATION OF CONSUMER PERCEPTIONS RELATING TO THE DIFFUSION OF DOMESTIC AUTOMATIC ENERGY CONSERVING DEVICES (DAECD)

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TABLE OF CONTENTS

PAGE

ACKNOWLEDGEMENTS.. i

TABLE OF CONTENTS... ii

1.0 INTRODUCTION.. 1

- 1.1 The Role of DAECDs in Residential Energy Conservation.......................... 2
- 1.2 The Theoretical Basis for the Study................. 5

2.0 METHODS AND PROCEDURES................................ 7

- 2.1 The Interview Task.................................. 7
- 2.2 The Research Assistants............................. 8
- 2.3 Questionning Procedures............................. 9
- 2.4 The Sample.. 10

3.0 TOTAL RESPONDENT RESULTS.............................. 11

- 3.1 Open-Ended Comments................................. 12
  - 3.1.1 Savings Comments................................ 13
  - 3.1.2 Price Comments.................................. 14
  - 3.1.3 Installation Comments........................... 15
  - 3.1.4 Product Performance Comments.................... 16
  - 3.1.5 Life Style Comments............................. 17
  - 3.1.6 Simplicity Comments............................. 18
  - 3.1.7 "Need More Information" Comments................ 19
  - 3.1.8 Believability Comments.......................... 20
- 3.2 Diffusion Factors................................... 21
  - 3.2.1 Relative Advantage Factor....................... 21
  - 3.2.2 Life Style Compatibility Factor................. 31
  - 3.2.3 Simplicity Factor............................... 34
  - 3.2.4 Communicability Factor.......................... 37
  - 3.2.5 Trialability Factor............................. 40
- 3.3 Product Interest Segments........................... 43

4.0 IN-DEPTH ANALYSIS OF WATER HEATER TIMER INTEREST SEGMENTS.. 50

- 4.1 Open-Ended Comments................................. 50
- 4.2 Diffusion Factors................................... 53
- 4.3 Energy Conservation Scales.......................... 56
- 4.4 Life Style Scales................................... 58
- 4.5 Demographics and Household Characteristics.......... 63
- 4.6 Conclusions... 71

5.0 IN-DEPTH ANALYSIS OF SHOWER FLOW RESTRICTOR INTEREST SEGMENTS.. 74

5.1 Open-Ended Comments................................ 74
5.2 Diffusion Factors.................................. 78
5.3 Energy Conservation Scales......................... 81
5.4 Life Style Scales.................................. 83
5.5 Demographics and Household Characteristics........... 88
5.6 Conclusions.. 96

6.0 IN-DEPTH ANALYSIS OF LOW FLOW SHOWERHEAD INTEREST SEGMENTS.. 98

6.1 Open-Ended Comments................................ 98
6.2 Diffusion Factors.................................. 102
6.3 Energy Conservation Scales......................... 105
6.4 Life Style Scales.................................. 107
6.5 Demographics and Household Characteristics.......... 112
6.6 Conclusions.. 120

7.0 IN-DEPTH ANALYSIS OF SETBACK THERMOSTAT INTEREST SEGMENTS.. 123

7.1 Open-Ended Comments................................ 123
7.2 Diffusion Factors.................................. 126
7.3 Energy Conservation Scales......................... 130
7.4 Life Style Scales.................................. 132
7.5 Demographics and Household Characteristics.......... 137
7.6 Conclusions.. 145

8.0 IN-DEPTH ANALYSIS OF FURNACE FLUE DAMPER INTEREST SEGMENTS.. 147

8.1 Open-Ended Comments................................ 147
8.2 Diffusion Factors.................................. 151
8.3 Energy Conservation Scales......................... 154
8.4 Life Style Scales.................................. 156
8.5 Demographics and Household Characteristics.......... 161
8.6 Conclusions.. 169

9.0 IN-DEPTH ANALYSIS OF FLUE HEAT RECOVERY DEVICE INTEREST SEGMENTS.. 170

9.1 Open-Ended Comments................................ 170
9.2 Diffusion Factors.................................. 173
9.3 Energy Conservation Scales......................... 176
9.4 Life Style Scales.................................. 178
9.5 Demographics and Household Characteristics.......... 183
9.6 Conclusions.. 191

10.0 IN-DEPTH ANALYSIS OF AUTO GAS SAVING DEVICE INTEREST SEGMENTS.. 192

10.1 Open-Ended Comments................................ 192
10.2 Diffusion Factors.................................. 196
10.3 Energy Conservation Scales......................... 199
10.4 Life Style Scales.................................. 201
10.5 Demographics and Household Characteristics......... 206
10.6 Conclusions.. 214

11.0 OVERALL CONCLUSIONS AND RECOMMENDATIONS................. 216

12.0 REFERENCES.. 221

APPENDIX A: SELECTED OPEN-ENDED COMMENTS

APPENDIX B: INTERVIEW MATERIALS

1.0 INTRODUCTION

Although Canadians are becoming increasingly concerned with the escalating cost of conventional fuel sources, and although Canadians profess to be increasingly engaged in energy conserving behaviours (McDougall and Keller, 1981), Canada still uses more energy per capita than any other country in the world. While this can be partially explained by climatic and geographic problems specific to Canada, these problems do not explain why Canada, alone among the nations of the western world, has been unable to reduce the percentage of total national energy consumption attributable to the residential sector (Financial Post, August 15, 1981). A recent study (Cullen, 1979) has indicated that if Canadians were to purchase and use available energy-efficient, and energy conserving technology, residential sector energy use in Canada could be reduced by 30% of present levels. Canadian policymakers therefore understandably wish to encourage consumer adoption of energy conserving behaviour and technology.

The technology for reducing domestic energy consumption exists - but it has received neither rapid nor widespread acceptance in Canada. This present study is an in-depth investigation of consumer perceptions which may affect the diffusion of a particular type of energy conserving technology - devices designed specifically to save residential energy. These devices are referred to as Domestic Automatic Energy Conserving Devices. (DAECDs).

1.1 The Role of DAECDs in Residential Energy Conservation

An individual consumer wishing to reduce his home energy consumption has three options: (a) he can change his life style (e.g.

join a car pool); (b) he can replace existing energy-using home equipment with more efficient equipment (e.g. buy a new, better insulated refrigerator); or (c) he can install devices (i.e. DAECDs) which will help the consumer use his current home equipment more effectively.

DAECDs (the focus of this research) are of particular interest because this category of technological innovation includes all the devices whose sole function is to save energy in the house. There are three distinct types of DAECD:

1) Behavioural Replacement DAECDs - these devices make residential energy conservation easier by automating an energy conserving behavioural adjustment. For example, residential energy may be saved by turning down the thermostat at appropriate times; however, a DAECD (such as an automatic thermostat setback device) may be a more efficient and convenient method of realizing these energy savings.

2) Unobtrusive DAECDs - these devices, designed solely to save residential energy, would not normally be noticed by the resident once they were installed; nor do they replace an energy conservation behavioural activity. Unobtrusive DAECDs, such as furnace flue dampers or flue heat recovery devices, are designed to make energy consuming technology (e.g. furnaces or automobiles) more energy efficient, whereas Behavioural Replacement DAECDs are designed to make energy conserving behaviour more efficient and convenient. Both, however, are DAECDs because they are automated devices, the sole purpose of which is to save residential energy.

3) Behaviourally Obtrusive DAECDs - these devices, also designed solely to save residential energy, impact on the consumers' behaviour

in some fashion; they do not replace an energy conserving behaviour as is the case with the Behavioural Replacement DAECDs, nor are they unobtrusive. In contrast, this third group of DAECDs will save residential energy but will require certain behavioural adjustments - such as accepting slightly reduced shower quality with a shower flow restrictor.

Thus DAECDs may usefully be categorized into three separate groups based on their impact on consumer behaviour. These same devices, however, may also be grouped according to the type of residential energy usage that they attempt to reduce. This approach results in five categories of DAECD because there are five categories of residential energy use. Thus these devices may be grouped into:

1) transportation energy saving devices
2) space heating energy saving devices
3) water heating energy saving devices
4) lighting energy saving devices
5) appliance energy saving devices

Collectively DAECDs appear to hold considerable potential for reducing total household energy consumption, although there exist great differences among specific DAECDs in terms of technical performance and consumer acceptability. A recent paper (Wharton and Cullen, February 1981) indicated that the major areas of potential residential energy savings for DAECDs were in the categories of space heating energy saving devices and water heating energy saving devices. Lighting and appliance energy saving devices were often purchased for reasons other than saving energy (eg. the aesthetic value of light dimmer switches) and the potential energy savings often were found to be trivial. Transportation energy saving devices provide an interesting anomaly. These DAECDs (such as Ram Jet Superchargers, Super Energy Cells, Capacitive Discharge Ignition Systems) have achieved a fair degree of market penetration in comparison with other DAECDs, but manufacturers' claims of energy savings have not been substantiated in objective tests. The potential savings for space heating DAECDs (such as flue heat recovery devices, automatic thermostat setback devices and furnace flue dampers) and water heating DAECDs (showerheads, shower flow restrictors and water heater timers) on the other hand are well documented.

1.2 The Theoretical Basis for the Study

Research on the rate with which new or innovative products are adopted by consumers has focussed almost exclusively on the diffusion of specific, single products or ideas. Comparatively little work has been done on simultaneously studying the diffusion of a number of related goods to understand the relationship between product characteristics and marketplace acceptance.

Rogers & Shoemaker, 1971 summarized the results of several studies (most of which were concerned with the diffusion of agricultural innovations) relating product characteristics to diffusion. Rogers and Shoemaker found that the major variable explaining the success or failure of the diffusion of these innovations was perceptions of relative advantage (a cost/benefit concept). To a lesser extent four variables other than relative advantage have shown some impact on the diffusion of innovation. These include compatibility, which refers to how well the device fits in with the consumer's current lifestyle; simplicity/complexity which refers to the ease or difficulty that consumers have in understanding how an innovation works; trialability which refers to the ease of testing the device and communicability which refers to the presence or absence of barriers to the development of word-of-mouth interpersonal communications about the device.

These five diffusion factors form the basis for studying the relationship between product characteristics and marketplace acceptance (diffusion). For this study of DAECDs, the diffusion factors allow an organized investigation of two major questions:

1) For each specific DAECD separately, what product characteris-

tics encourage or discourage diffusion?

2) What are the general concerns that affect all devices within a DAECD category (behavioural replacement DAECDs, unobtrusive DAECDs, or behaviourally obtrusive DAECDs)?

2.0 METHODS AND PROCEDURES

The research methodology and its rationale has been reported in detail in the preliminary reports (Wharton, Cullen, et al, August and October, 1982). Only an overview of the major methodological issues is summarized here.

Past research into the relationship between perceptual issues and innovation adoption (particularly with respect to consumer goods) is quite skimpy. In order to develop an appreciation for the relevant variables affecting the diffusion of DAECDs it was imperative that the research allow and encourage full qualitative expression by the respondents. This could only have been accomplished through open, personal interviews. Also, it was intended that this open--ended approach would lead to the development of a simplified research methodology which could meaningfully investigate these issues in a non-personal interview. (The York team of Fenwick, Heeler, and Simmie will be using the results of this process in developing their mail questionnaire.)

2.1 The Interview Task

Based upon the work of Wharton and Cullen, and an extensive pretest period, information was gathered from respondents in the following manner: Each respondent was informed that the interview would take approximately forty-five minutes, and that every individual who participated in the study would be eligible for one of two $250 gift certificates from a major Canadian department store. Each respondent was asked to rate seven DAECDs (see Appendix B) as to usefulness in his own home and likelihood of purchase. Finally, the respondent completed a lifestyle and demographics questionnaire. At the end of the interview, each respondent was given a debriefing sheet that provided the most accurate information available on the actual performance characteristics of the DAECDs.

The following summarizes the steps of the interview:

1. Participation requested.
2. Brief introduction to the seven devices.
3. For each device separately (7 times) - a more detailed description of each device followed by ratings of the respondents overall opinion (usefulness and purchase intention) and then unstructured open-ended discussion about the device.
4. For each device separately (7 times) - ratings of agreement with device-related diffusion items.
5. Ratings of agreement with life-style items.
6. Completion of a household characteristics questionnaire.
7. Provision of debriefing information sheet and termination of interview.

2.2 The Research Assistants

Four research assistants to conduct the in-depth probing were hired following an intensive screening process. Each research assistant had to be an undergraduate in the faculty of Administrative Studies of the University of Manitoba, each had to be a good student, and each had to have taken the Marketing Research course (and therefore have had some experience in doing research and interviewing). Each research assistant was involved in the development of the research instrument following a rigorous period of training in open-ended interview techniques. Each research assistant was observed and critiqued by the principal researchers and the other research assistants in training sessions both in laboratory and field trial situations. The principal researchers periodically monitored interviews conducted during the course of the study.

2.3 Questionning Procedures

The questionning procedures were designed to elicit unbiased opinions on several DAECDs from 400 Winnipeg residents. The procedure consisted of two main sections; the first was an attempt at discovering consumers' perceptions of the DAECDs, and the second was designed to get more information about the respondent. The procedure is organized as follows:

1. Product Information
    a) usefulness/purchase ratings
    b) open ended probing
    c) attribute rating
2. Respondent Information
    a) Lifestyle
    b) household characteristics
    c) demographics

Product Information: An earlier paper by Wharton and Cullen (March, 1981) described the energy saving potential of several DAECDs. Based on that study, it was decided to study consumer perceptions of seven DAECDs (furnace flue damper, flue heat recovery device, automatic thermostat setback device, low flow showerhead, showerhead flow restrictor, water heater timer and a capacitive discharge ignition system).

The respondent was first asked to rate the usefulness of each device for his own home on a five point scale, and then he was asked to rate his likelihood of purchasing that device on a four point scale.

The results of the above ratings formed the basis for an open-ended in-depth probe in which the interviewers attempted to elicit the respondent's perceptions of the positive and negative characteristics of each device.

Following the open-ended probing the respondent was asked to complete a product attribute questionnaire for each device. The questionnaire was designed to insure that all respondents expressed opinions about the DAECDs on each of Rogers & Shoemaker's dimensions.

2.4 The Sample

The sample consisted of four hundred and two (402) male and female (approximately 50% male and 50% female) adults residing in single-family, detached houses in Winnipeg, Manitoba. Statistics Canada (1976) Housing Statistics were used to determine clusters of equal numbers of housing units in Winnipeg. These clusters were then drawn onto a city map with street segments numbered in each area. Five street segments were randomly selected for each housing cluster; four interviews were conducted (one by each of the four interviewers) in each street segment.

3.0 TOTAL RESPONDENT RESULTS

This results section is concerned with overall product perceptions and product interest based on analyses of total respondents. There are three parts to this section.

Section 3.1 summarizes the reactions of the sample to each DAECD as expressed in open-ended conversations. The open-ended data has advantages and disadvantages. The primary advantage of open-ended data is that it allows the respondent to define what issues are important and how they want to talk about the products. The result of open-ended data analysis is a very rich understanding of what the individual respondent thinks about the two or three attributes they consider most relevant.

The major disadvantage of open-ended data is its incompleteness. Respondents will rarely "touch all bases" when discussing a product. Therefore, to complement the open-ended data, a series of product attribute questions were answered by each respondent for each DAECD. The attributes were selected to cover the five product characteristic diffusion factors (relative advantage, lifestyle compatibility, simplicity, communicability and trialability). Section 3.2 summarizes the responses of the total sample to these attributes.

Finally, each respondent was classified as to their level of interest in each DAECD in order to define potential target consumers. The analyses of product interest segments is presented in Section 3.3.

3.1 Open-Ended Comments

During each interview the respondent was asked to discuss aspects of each device which they liked and aspects which they did not like. The comments made by each respondent were then recorded. (As much as possible, the actual words and expressions of the respondents were written down.) Much of the richness of the open-ended data is best appreciated by reading the comments in their original form. Some selected examples of these comments is reported in Appendix A. For report purposes, however, the open-ended comments were classified into eight categories: savings comments, price comments, installation comments, product performance comments, lifestyle comments, simplicity comments, "need more information" comments, and believability comments. (A small percentage of the comments could not be classified into these eight categories. These few comments are not reported.) The comments were then coded as to whether they were negative or positive.

Tables 3.1.1 to 3.1.8 display results from the total respondent analyses of open-ended comments. In general, the majority of the open-ended comments related to attributes which were discussed on the information sheets (savings, price, installation, and product performance characteristics). The other types of comments (lifestyle, simplicity, the need for additional information and believability) were usually only mentioned by the respondents when they perceived a problem with their own use of the product.

In addition to this overall pattern in the open-ended comments, it was apparent that there was considerable variety in each comments category in the character of the comments for each DAECD. These will be reviewed for each type of comment separately.

3.1.1 Savings Comments

- The Auto Gas Saving Device savings comments were frequently enthusiastic.
- The shower devices (shower Flow Restrictors and Low Flow Showerheads) tended to produce mild savings comments. People did not seem to view the level of savings for these DAECD as an important positive or negative.
- Many respondents liked the savings claims for Set Back Thermostats because they already set back their thermostats manually.
- The majority of the positive savings comments for Furnace Flue Dampers and Flue Heat Recovery Devices were indifferent. People accepted the saving claims but did not care about them because of other, more important, negatives.

TABLE 3.1.1

TOTAL RESPONDENT ANALYSES OF OPEN-ENDED COMMENTS: Savings Comments

	Percentage by Type of Mention			
Type of DAECD	Negative Mention	No Mention	Postive Mention	Total
Water Heater Timers	23.9	44.3	31.8	100.0%
Shower Flow Restrictors	23.4	40.8	35.8	100.0%
Low Flow Showerheads	16.9	34.6	48.5	100.0%
Set Back Thermostats	43.0	30.6	26.4	100.0%
Furnace Flue Dampers	11.7	28.9	59.5	100.0%
Flue Heat Recovery Devices	17.9	32.8	49.3	100.0%
Auto Gas Saving Devices	10.0	29.4	60.7	100.0%

3.1.2 Price Comments

- Most price comments were simple statements of liking or disliking the price.
- The Furnace Flue Dampers and the Flue Heat Recovery Devices, (probably because of their high price), tended to produce more costs relative to savings comments.

TABLE 3.1.2

TOTAL RESPONDENT ANALYSES OF OPEN-ENDED COMMENTS: Price Comments

Type of DAECD	Percentage by Type of Mention Negative Mention	No Mention	Postive Mention	Total
Water Heater Timers	1.2	91.0	7.7	100.0%
Shower Flow Restrictors	1.0	74.9	24.1	100.0%
Low Flow Showerheads	3.7	75.4	20.9	100.0%
Set Back Thermostats	8.5	85.1	6.5	100.0%
Furnace Flue Dampers	44.0	53.5	2.5	100.0%
Flue Heat Recovery Devices	19.7	73.1	7.2	100.0%
Auto Gas Saving Devices	1.5	74.1	24.4	100.0%

3.1.3 Installation Comments

- Almost all positive installation comments referred to liking being able to install the device on their own.
- Most negative installation comments either referred to the cost of having someone else install the device or referred to the bother of finding someone to install the device.

TABLE 3.1.3

TOTAL RESPONDENT ANALYSES OF OPEN-ENDED COMMENTS: Installation Comments

	Percentage by Type of Mention			
Type of DAECD	Negative Mention	No Mention	Postive Mention	Total
Water Heater Timers	3.2	86.8	10.0	100.0%
Shower Flow Restrictors	0.7	83.6	15.7	100.0%
Low Flow Showerheads	1.0	81.8	17.2	100.0%
Set Back Thermostats	11.9	86.1	2.0	100.0%
Furnace Flue Dampers	9.7	89.1	1.2	100.0%
Flue Heat Recovery Devices	7.7	91.0	1.2	100.0%
Auto Gas Saving Devices	7.7	81.1	11.2	100.0%

3.1.4 Product Performance Comments

- There was a slight tendency for all DAECDs to produce favorable comments about the automatic nature of the products.
- Shower Flow Restrictors elicited many concerns about the reduced shower quality. In contrast, many people were positive about the Low Flow Showerhead's maintaining of the shower quality.
- Most of the Set Back thermostats positives concerned the convenience of the device. For some it was helping them to remember to set the thermostat back at night. For others it was the turning the thermostat back up half an hour or so before the household arose in the morning.
- Many people expressed concern for the potential hazards of the Furnace Flue Dampers. There was also some concern for the safety of the Flue Heat Recovery Devices.
- Some people expressed the concern that the Auto Gas Saving Device might adversely affect the engine performance (e.g. loss of power).

TABLE 3.1.4

TOTAL RESPONDENT ANALYSES OF OPEN-ENDED COMMENTS: Product Performance Comments

	Percentage by Type of Mention			
Type of DAECD	Negative Mention	No Mention	Postive Mention	Total
Water Heater Timers	4.5	87.6	8.0	100.0%
Shower Flow Restrictors	24.6	73.6	1.7	100.0%
Low Flow Showerheads	11.7	67.7	20.6	100.0%
Set Back Thermostats	4.7	64.4	30.8	100.0%
Furnace Flue Dampers	22.6	72.9	4.5	100.0%
Flue Heat Recovery Devices	10.7	83.1	6.2	100.0%
Auto Gas Saving Devices	10.7	86.6	2.7	100.0%

3.1.5 Life Style Comments

- Life style comments included all statements which directly related the ownership or use of DAECDs to some facet of the respondent's (or the respondent's family's) lifestyle. This type of comment was almost never volunteered for the Furnace Flue Dampers or the Flue Heat Recovery Devices. These comments were fairly common for the other DAECDs.

- There were moderate levels of life style negatives for the Auto Gas Saving Devices, the Shower Flow Restrictors, and the Low Flow Showerheads. The respondents claimed to either not drive very much or not shower very much and that therefore the devices were not particularly useful.

- There were many negative life style comments concerning the Set Back Thermostats. Most of these negatives were volunteered by individuals who claimed they already set back their thermostats manually and that consequently there was no need for the device.

- The strongest life style negatives were associated with the Water Heater Timers. Not only were there many of these negatives, but negative aspects were emphatically volunteered. For a variety of personal reasons, many respondents thought that doing without hot water at certain times of day would be very inconvenient.

TABLE 3.1.5

TOTAL RESPONDENT ANALYSES OF OPEN-ENDED COMMENTS: Life Style

	Percentage by Type of Mention			
Type of DAECD	Negative Mention	No Mention	Postive Mention	Total
Water Heater Timers	44.8	48.8	6.5	100.0%
Shower Flow Restrictors	18.7	77.4	4.0	100.0%
Low Flow Showerheads	15.7	78.6	5.7	100.0%
Set Back Thermostats	43.0	48.5	8.5	100.0%
Furnace Flue Dampers	1.5	98.3	0.2	100.0%
Flue Heat Recovery Devices	1.5	98.5	0.0	100.0%
Auto Gas Saving Devices	9.7	87.1	3.2	100.0%

3.1.6 Simplicity Comments

- No consistent pattern of simplicity comments were volunteered for the Water Heater Timers, the Shower Flow Restrictors, the Low Flow Showerheads, or the Set Back Thermostats.

- Most of the negative simplicity comments (complexity comments) were concerned with the difficulty the respondents had in understandinq how the device is supposed to work.

- Simplicity negatives were also volunteered when discussing the Auto Gas Saving Devices. For this device the concern tended to relate to the complexity of the automobile engine. These respondents appeared to feel that adding an additional complexity to the engine system might cause problems later.

TABLE 3.1.6

TOTAL RESPONDENT ANALYSES OF OPEN-ENDED COMMENTS: Simplicity Comments

	Percentage by Type of Mention			
Type of DAECD	Negative Mention	No Mention	Postive Mention	Total
Water Heater Timers	0.7	98.0	1.2	100.0%
Shower Flow Restrictors	1.5	97.0	1.5	100.0%
Low Flow Showerheads	0.7	99.3	0.0	100.0%
Set Back Thermostats	0.7	97.5	1.7	100.0%
Furnace Flue Dampers	4.5	93.3	2.2	100.0%
Flue Heat Recovery Devices	10.2	89.3	0.5	100.0%
Auto Gas Saving Devices	6.0	94.0	0.0	100.0%

3.1.7 "Need More Information" Comments

- A small percentage (approximately 5%) of the discussions on each DAECD elicited the comment that the respondent needed more information than was presented on the information sheet.
- For the Furnace Flue Dampers and the Flue Heat Recovery Devices, some respondents also volunteered that because of the nature of the commitment involved they would have to discuss the pros and cons with an expert.
- A special type of information was demanded by many people in discussing the Auto Gas Saving Devices. These individuals had heard or read that the devices were gimmicks. Because of this, while they were interested in the product, they wouldn't consider buying it unless reputable proof was provided that the device actually saved gas.

TABLE 3.1.7

TOTAL RESPONDENT ANALYSES OF OPEN-ENDED COMMENTS: "Need More Information" Comments

	Percentage by Type of Mention			
Type of DAECD	Negative Mention	No Mention	Postive Mention	Total
Water Heater Timers	5.0	95.0	0.0	100.0%
Shower Flow Restrictors	5.5	94.5	0.0	100.0%
Low Flow Showerheads	4.7	95.3	0.0	100.0%
Set Back Thermostats	6.7	93.3	0.0	100.0%
Furnace Flue Dampers	10.0	90.0	0.0	100.0%
Flue Heat Recovery Devices	16.7	83.3	0.0	100.0%
Auto Gas Saving Devices	21.4	78.4	0.2	100.0%

3.1.8 Believability Comments

- Believability comments include all statements which reflect uncertainty as to the truth of the savinqs claims. For most DAECDs, that uncertainty is mild (e.g. "If it really can save $5 per month....").

- The Furnace Flue Dampers and the Flue Heat Recovery Devices discussions also included some statements of definite disbelief (e.g. "I find it hard to believe that that device could save that much....").

- The Auto Gas Saving Devices not only elicited uncertainty and definite disbelief; it often generated comments of complete belief that the product doesn't live up to its claims (e.g. "It's a rip off!").

TABLE 3.1.8

TOTAL RESPONDENT ANALYSES OF OPEN-ENDED COMMENTS: Believability Comments

	Percentage by Type of Mention			
Type of DAECD	Negative Mention	No Mention	Postive Mention	Total
Water Heater Timers	9.2	90.8	0.0	100.0%
Shower Flow Restrictors	11.2	88.8	0.0	100.0%
Low Flow Showerheads	13.2	86.3	0.5	100.0%
Set Back Thermostats	8.7	90.3	1.0	100.0%
Furnace Flue Dampers	14.2	85.8	0.0	100.0%
Flue Heat Recovery Devices	18.9	80.3	0.7	100.0%
Auto Gas Saving Devices	38.8	60.7	0.5	100.0%

3.2 Diffusion Factors

According to the generally accepted Rogers and Shoemaker (1971) theory of new product diffusion, there are five product characteristic factors which affect the speed of and potential for new product diffusion. These factors are relative advantage, life style, compatibility, simplicity, communicability, and trialability. Each of these diffusion factors have been measured by having respondents rate several relevant attributes.

3.2.1 Relative Advantage Factor

Relative advantage is essentially a cost-benefit concept. For DAECDs the benefits are savings in energy. The costs include dollar purchase costs as well as any perceived installation problems. Each of these three components of relative advantage have been measured by rating several relevant attributes. Tables 3.2.1.1 to 3.2.1.8 summarize these results.

Some observations concerning perceptions of relative advantage include:

- Table 3.2.1.1: "This device would soon pay for itself". All but one of the devices were generally viewed as having sufficient savings to pay for themselves (average rating in excess of 3.00, the neutral position). The one exception was Furnace Flue Dampers for which comparatively more people thought it would not pay for itself.

- Table 3.2.1.2: "I doubt this device could save the amount of energy claimed." There were no strong response patterns for this attribute. Most DAECDs were mildly positive. Only for the Furnace Flue Damper and the Auto Gas Saving Device, however, were the average ratings negative.

- Table 3.2.1.3: "It would be hard to determine how much energy this device saves." People generally felt that energy savings claims would be hard to verify. Though there were differences in the degree of perceived difficulty across the DAECDs, all were viewed as being hard to determine the energy savings.

- Tables 3.2.1.4 and 3.2.1.5: "The device appears to be priced reasonably given the claimed savings" and "This device costs too much for the amount of energy it can save." With the exception of the Furnace Flue Dampers, the DAECDs were viewed as reasonably priced given the potential for savings. The Furnace Flue Damper, however, was overpriced for the perceived savings.

- Table 3.2.1.6: "The price of this device is too high for me to consider purchasing it." Most DAECDs were viewed as affordable. The two furnace devices, the Furnace Flue Dampers and the Flue Heat Recovery Devices, however, were often viewed as too expensive.

- Table 3.2.1.7: "This device seems easy to install". The two furnace DAECDs were viewed as posing installation problems. The other DAECDs were rated, to varying degrees, as easy to install.

- Table 3.2.1.8: "This device should fit easily with my (car, furnace, shower, water heater)." There were few doubts about whether the devices could be fitted into the various systems.

Overall, the non-furnace devices were viewed as having positive relative advantages. The relative advantage of the Furnace Flue Damper was negative (small savings, big price and difficult installation). The results for the relative advantage of the Flue Heat Recovery Device were ambiguous.

TABLE 3.2.1.1

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "This Device Would Soon Pay For Itself"

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	0.8	15.5	21.0	54.3	8.5	3.54
Shower Flow Restrictors	1.3	8.9	19.4	56.8	13.6	3.73
Low Flow Showerheads	1.6	11.3	24.0	53.8	9.2	3.58
Set Back Thermostats	1.3	18.5	21.0	53.3	6.0	3.44
Furnace Flue Dampers	3.8	35.3	34.8	22.8	3.3	2.87
Flue Heat Receovery Devices	1.3	23.7	36.0	36.3	2.8	3.15
Auto Gas Saving Devices	2.3	10.7	22.2	54.3	10.9	3.61

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; and (5) = Strongly Agree.

2. Averages differ statistically significantly ($F = 45.55$; $\alpha < .05$)

TABLE 3.2.1.2

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "I Doubt This Device Could Save The Amount Of Energy Claimed." (reverse scored)

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	2.0	31.0	29.3	34.8	3.0	3.06
Shower Flow Restrictors	3.7	29.5	31.8	32.6	2.4	3.01
Low Flow Showerheads	3.2	28.2	34.2	30.0	4.5	3.05
Set Back Thermostats	3.3	25.1	28.3	38.1	5.3	3.17
Furnace Flue Dampers	3.6	32.9	33.7	28.1	1.8	2.92
Flue Heat Recovery Devices	2.5	26.0	37.4	32.6	1.5	3.04
Auto Gas Saving Devices	7.3	28.5	35.1	26.5	2.5	2.88

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Agree; (2) = Agree; (3) = Neutral; (4) = Disagree; and (5) = Strongly Disagree.

2. Averages differ statistically significantly ($F = 4.14; \alpha < .05$)

TABLE 3.2.1.3

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "It Would Be Hard to Determine How Much Energy This Device Saves." (reverse scored)

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	2.3	48.3	23.0	25.8	0.8	2.75
Shower Flow Restrictors	4.7	53.0	22.0	18.6	1.6	2.59
Low Flow Showerheads	4.7	49.2	19.7	24.2	2.1	2.70
Setback Thermostats	3.5	42.8	18.8	31.8	3.3	2.88
Furnace Flue Dampers	3.6	46.7	21.7	26.8	1.3	2.76
Flue Heat Recovery Devices	3.8	51.8	20.1	22.6	1.8	2.67
Auto Gas Saving Devices	5.8	38.9	18.7	32.3	4.3	2.90

---

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Agree; (2) = Agree; (3) = Neutral; (4) = Disagree; and (5) = Strongly Disagree.

2. Averages differ statistically significantly ($F = 5.48$; $\alpha < .05$)

TABLE 3.2.1.4

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "The Device Appears To Be Priced Reasonably Given the Claimed Savings"

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	0.0	10.5	9.3	71.0	9.3	3.79
Shower Flow Restrictors	1.3	5.2	4.2	72.8	16.5	3.98
Low Flow Showerheads	1.1	6.8	8.4	71.1	12.6	3.87
Set Back Thermostats	1.3	14.5	13.8	63.9	6.5	3.60
Furnace Flue Dampers	6.4	47.3	21.9	22.9	1.5	2.66
Flue Heat Receovery Devices	1.5	27.5	20.2	48.0	2.8	3.22
Auto Gas Saving Devices	1.0	6.3	8.3	72.5	11.9	3.88

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Disagree; (2) =Disagree; (3) = Neutral; (4) = Agree; and (5) = Strongly Agree.

2. Averages differ statistically significantly (F = 130.29; $\alpha < .05$)

TABLE 3.2.1.5

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "This Device Costs Too Much For the Amount of Energy it Can Save" (reverse scored)

Type of DAECD	Percentages by Rating Category[1] (1)	(2)	(3)	(4)	(5)	Average Rating[2]
Water Heater Timers	1.3	12.3	15.3	64.8	6.5	3.63
Shower Flow Restrictors	1.0	5.0	7.3	68.6	18.1	3.98
Low Flow Showerheads	0.8	6.1	13.7	66.6	12.9	3.85
Setback Thermostats	2.0	15.3	15.5	60.5	6.8	3.55
Furnace Flue Dampers	6.4	42.9	27.6	22.2	1.0	2.69
Flue Heat Recovery Devices	2.5	27.7	28.2	39.0	2.5	3.11
Auto Gas Saving Devices	1.8	7.1	12.2	65.6	13.4	3.82

---

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Agree; (2) = Agree; (3) = Neutral; (4) = Disagree; and (5) = Strongly Disagree.

2. Averages differ statistically significantly ($F = 116.40$; $\alpha < .05$)

TABLE 3.2.1.6

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "The Price of This Device Is Too High For Me to Consider Purchasing It." (reverse scored)

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	1.5	10.5	12.5	68.2	7.3	3.69
Shower Flow Restrictors	1.8	5.0	5.2	68.4	19.6	3.99
Low Flow Showerheads	1.9	5.6	8.5	67.5	16.7	3.92
Setback Thermostats	1.5	20.1	17.0	54.4	7.0	3.45
Furnace Flue Dampers	11.5	54.1	15.3	17.3	1.8	2.44
Flue Heat Recovery Devices	3.3	34.6	26.3	33.1	2.8	2.97
Auto Gas Saving Devices	1.0	6.3	7.6	71.7	13.4	3.90

---

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Agree; (2) = Agree; (3) = Neutral; (4) = Disagree; and (5) = Strongly Disagree.

2. Averages differ statistically significantly (F = 176.53; $\alpha < .05$)

TABLE 3.2.1.7

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "This Device Seems Easy to Install"

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	0.5	10.3	17.9	62.2	9.1	3.69
Shower Flow Restrictors	0.5	2.6	3.7	70.2	23.0	4.13
Low Flow Showerheads	0.3	0.3	5.5	66.6	27.4	4.21
Set Back Thermostats	5.3	32.5	16.0	39.3	7.0	3.10
Furnace Flue Dampers	14.6	43.7	12.3	26.1	3.3	2.60
Flue Heat Receovery Devices	11.9	41.4	18.4	25.8	2.5	2.65
Auto Gas Saving Devices	2.3	18.0	21.5	51.9	6.3	3.42

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; and (5) = Strongly Agree.

2. Averages differ statistically significantly (F = 196.70; $\alpha < .05$)

TABLE 3.2.1.8

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "This Device Should Fit Easily With my (Car, Furnace, Shower, Water Heater)"

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	2.0	8.3	18.3	62.8	8.8	3.68
Shower Flow Restrictors	1.0	5.2	10.7	67.6	15.4	3.97
Low Flow Showerheads	1.3	3.4	9.5	66.3	19.5	3.99
Set Back Thermostats	1.0	9.5	15.3	64.7	9.5	3.72
Furnace Flue Dampers	2.6	13.0	26.0	54.1	4.3	3.44
Flue Heat Receovery Devices	2.8	14.4	28.5	49.1	5.3	3.40
Auto Gas Saving Devices	1.5	6.3	26.6	58.0	7.6	3.64

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; and (5) = Strongly Agree.

2. Averages differ statistically significantly ($F = 28.44$; $\alpha < .05$)

3.2.2 Life Style Compatibility Factor

The life style compatibility factor is concerned with how peoples' life patterns impact on the diffusion of an innovation. Two questions were asked relative to this factor: "The use of this device might upset our daily household routine." and "Using this device would be inconvenient for my family."

The results of perceptions of these two attributes are summarized in Tables 3.2.2.1 and 3.2.2.2. Some observations concerning life style compatibility include:

- The Water Heater Timer had the lowest average rating on both attributes. In addition, the response patterns for this DAECD were bi-modal for both attributes. This bi-modality implies strong divergence of opinion. While more people feel the Water Heater Timer is not upsetting nor inconvenient, there were substantial numbers of respondents who felt the Water Heater Timer was not compatible with their life styles.
- The Set Back Thermostat and the Shower Flow Restrictor had similar, but milder, bi-modal response patterns for the two life style compatibility attributes. (Based on open-ended discussions, it was clear that the life style negatives for the Set Back Thermostats were frequently voiced by people who insist on keeping their home at a constant temperature. On the other hand, many of the Shower Flow Restrictor negatives were made by respondents whose families showered frequently and who, in consequence, would be particularly inconvenienced by the reduced shower quality.)
- There were no systematic life style compatibility problems for the other DAECDs.

TABLE 3.2.2.1

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "The Use of This Device Might Upset Our Daily Household Routine." (reverse scored)

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	7.8	30.6	7.0	46.1	8.5	3.17
Shower Flow Restrictors	3.1	10.2	11.5	61.9	13.1	3.72
Low Flow Showerheads	1.3	6.1	9.2	66.0	17.4	3.92
Setback Thermostats	2.0	13.5	7.8	64.2	12.5	3.72
Furnace Flue Dampers	1.0	5.9	10.7	67.6	14.8	3.89
Flue Heat Recovery Devices	1.0	3.0	9.4	73.6	12.9	3.94
Auto Gas Saving Devices	0.5	3.0	10.4	69.9	16.2	3.98

---

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Agree; (2) = Agree; (3) = Neutral; (4) = Disagree; and (5) = Strongly Disagree.

2. Averages differ statistically significantly ($F = 42.81$; $\alpha < .05$)

TABLE 3.2.2.2

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "Using This Device Would Be Inconvenient For my Family"

(reverse scored)

Type of DAECD	Percentages by Rating Category[1] (1)	(2)	(3)	(4)	(5)	Average Rating[2]
Water Heater Timers	5.8	28.8	9.0	48.8	7.8	3.24
Shower Flow Restrictors	2.4	14.1	13.4	56.3	13.9	3.65
Low Flow Showerheads	2.6	8.7	8.7	65.3	14.7	3.81
Setback Thermostats	2.0	15.3	8.0	64.2	10.5	3.66
Furnace Flue Dampers	2.3	6.4	13.7	65.9	11.7	3.78
Flue Heat Recovery Devices	0.8	6.3	12.6	70.7	9.6	3.82
Auto Gas Saving Devices	0.8	3.3	13.9	67.1	14.9	3.92

---

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Agree; (2) = Agree; (3) = Neutral; (4) = Disagree; and (5) = Strongly Disagree.

2. Averages differ statistically significantly ($F = 25.11$; $\alpha < .05$)

3.2.3 Simplicity Factor

All else equal, simple products tend to diffuse faster than more complex products. Two attributes relevant to this simplicity factor were rated: "I understand how this device is supposed to work" and "This device appears to be complicated." The results for these two attributes are summarized in Tables 3.2.3.1 and 3.2.3.2.

Some observations concerning the simplicity factor include:

- On average all seven DAECDs were rated as positive on the simplicity attributes.
- The Auto Gas Saving Device and the two furnace devices were viewed as less simple than the other DAECDs.

TABLE 3.2.3.1

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "I Understand How This Device Is Supposed to Work"

Type of DAECD	Percentages by Rating Category[1]					Average
	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	0.0	5.3	5.8	76.6	12.3	3.96
Shower Flow Restrictors	1.1	6.6	7.4	71.1	13.9	3.90
Low Flow Showerheads	0.0	8.0	5.8	70.8	15.4	3.94
Set Back Thermostats	0.3	5.8	6.3	74.7	12.9	3.94
Furnace Flue Dampers	1.0	17.1	10.7	64.5	6.6	3.59
Flue Heat Receovery Devices	2.3	21.8	15.7	54.2	6.1	3.40
Auto Gas Saving Devices	2.5	31.0	14.7	46.2	5.6	3.21

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; and (5) = Strongly Agree.

2. Averages differ statistically significantly (F = 54.68; $\alpha < .05$)

TABLE 3.2.3.2

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "This Device Appears To Be Complicated" (reverse scored)

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	1.3	4.0	11.3	75.5	8.0	3.85
Shower Flow Restrictors	0.3	3.4	5.2	71.3	19.8	4.07
Low Flow Showerheads	0.5	2.6	5.5	73.4	17.9	4.06
Set Back Thermostats	0.3	5.0	11.5	72.5	10.8	3.88
Furnace Flue Dampers	2.0	18.6	16.1	58.7	4.6	3.45
Flue Heat Recovery Devices	1.3	18.9	20.7	54.0	5.1	3.42
Auto Gas Saving Devices	1.8	12.6	25.2	54.4	6.0	3.50

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Disagree; (2) = Agree; (3) = Neutral; (4) = Disagree; and (5) = Strongly Agree.

2. Averages differ statistically significantly ($F = 53.76$; $\alpha < .05$)

3.2.4 Communicability Factor

Successful new product diffusion frequently requires support from informal word-of-mouth networks. Product attributes which impact on the development of such networks are included in this factor. Two statements were rated. First, the ease of discussing the product with ones friends makes a difference. Therefore respondents were asked to rate the statement, "It would be difficult to explain the operation of this device to my friends." Secondly, informal information networks will only develope if there is sufficient interest in discussing the products. Therefore, respondents rated the statement, "My friends would be interested in knowing about this device."

The results of rating these two statements are presented in Tables 3.2.4.1 and 3.2.4.2. Some observations concerning these results include:

- Consistent with the simplicity ratings, more people would find it more difficult to explain the furnace DAECD, and the Auto Gas Saving Device and easier to explain the other DAECDs.
- Based on analysis of total respondents there were few differences among the DAECDs in how interested people thought their friends would be. While the average ratings differed statistically significantly, the magnitude of the differences was relatively trivial.

TABLE 3.2.4.1

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "It Would Be Difficult to Explain the Operation of This Device To My Friends" (reverse scored)

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	1.0	11.0	8.8	70.8	8.5	3.75
Shower Flow Restrictors	1.3	10.2	9.1	67.4	12.0	3.79
Low Flow Showerheads	1.6	11.6	9.5	66.8	10.5	3.73
Setback Thermostats	0.5	10.6	10.8	70.3	7.8	3.74
Furnace Flue Dampers	2.8	28.3	14.0	50.0	4.8	3.26
Flue Heat Recovery Devices	3.3	33.9	15.7	44.6	2.5	3.09
Auto Gas Saving Devices	5.3	35.6	13.4	41.4	4.3	3.04

---

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Agree; (2) = Agree; (3) = Neutral; (4) = Disagree; and (5) = Strongly Disagree.

2. Averages differ statistically significantly ($F = 54.31$; $\alpha < .05$)

TABLE 3.2.4.2

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "My Friends Would Be Interested in Knowing About This Device"

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	1.5	18.0	33.1	43.9	3.5	3.30
Shower Flow Restrictors	2.9	18.3	37.1	47.9	4.2	3.22
Low Flow Showerheads	1.3	14.7	30.5	37.6	5.5	3.42
Set Back Thermostats	1.8	12.3	32.3	48.4	5.3	3.43
Furnace Flue Dampers	1.8	14.0	36.4	45.0	2.8	3.33
Flue Heat Receovery Devices	1.5	17.2	39.6	39.9	1.8	3.23
Auto Gas Saving Devices	3.5	15.7	27.8	48.1	4.8	3.35

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; and (5) = Strongly Agree.

2. Averages differ statistically significantly ($F = 3.62$; $\alpha < .05$)

3.2.5 Trialability Factor

The easier it is for individuals to try out a new product, the faster that new product will diffuse. The results of the rating of two trialability statements are reported in Tables 3.2.5.1 and 3.2.5.2. Some observations concerning these results include:

- Table 3.2.5.1: "The inability to try this device prior to purchase would make me hesitant to buy it." On average, all the DAECDs were rated near the neutral value. The furnace DAECDs and the Auto Gas Saving Device were rated comparatively negatively on this attribute whereas the other DAECDs were viewed more positively.

- Table 3.2.5.2: "I find it difficult to judge how useful this device would be because I cannot try it out in advance." Average ratings ranged from moderately negative (furnace DAECDs and Auto Gas Saving devices) to mildly positive (Low Flow Showerheads and Set Back Thermostats).

- For both statements, average responses were near neutral. However all DAECDs showed bi-modal response patterns. This implies there are differences of opinion within the total sample.

TABLE 3.2.5.1

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "The Inability to Try this Device Prior to Purchase Would Make Me Hesitant to Buy It" (reverse scored)

Type of DAECD	Percentages by Rating Category[1] (1)	(2)	(3)	(4)	(5)	Average Rating[2]
Water Heater Timers	3.8	32.6	17.5	43.4	2.8	3.09
Shower Flow Restrictors	4.2	25.6	18.3	47.3	4.7	3.23
Low Flow Showerheads	2.9	28.5	16.6	45.6	6.3	3.24
Setback Thermostats	3.0	28.1	18.3	46.1	4.5	3.21
Furnace Flue Dampers	7.4	40.7	20.4	29.8	1.8	2.78
Flue Heat Recovery Devices	6.3	42.8	20.4	29.0	1.5	2.76
Auto Gas Saving Devices	7.1	40.8	17.7	31.4	3.0	2.83

---

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Agree; (2) = Agree; (3) = Neutral; (4) = Disagree; and (5) = Strongly Disagree.

2. Averages differ statistically significantly ($F = 18.56$; $\alpha < .05$)

TABLE 3.2.5.2

TOTAL RESPONDENT ANALYSES OF DIFFUSION FACTORS: "I Find It Difficult to Judge How Useful This Device Would Be Because I Cannot Try It Out in Advance" (reverse scored)

	Percentages by Rating Category[1]					Average
Type of DAECD	(1)	(2)	(3)	(4)	(5)	Rating[2]
Water Heater Timers	3.3	37.8	22.3	34.3	2.3	2.94
Shower Flow Restrictors	5.0	35.5	20.4	34.5	4.7	2.98
Low Flow Showerheads	3.4	35.9	20.1	34.8	5.8	3.04
Setback Thermostats	2.8	38.0	15.3	40.8	3.3	3.04
Furnace Flue Dampers	6.1	49.4	16.3	26.2	2.0	2.69
Flue Heat Recovery Devices	4.5	52.1	19.1	21.9	2.3	2.65
Auto Gas Saving Devices	7.6	49.0	16.7	22.7	4.0	2.67

---

1. Responses were scored such that larger numbers were assigned to more positive perceptions. Specifically, for this attribute: (1) = Strongly Agree; (2) = Agree; (3) = Neutral; (4) = Disagree; and (5) = Strongly Disagree.

2. Averages differ statistically significantly ($F = 12.67$; $\alpha < .05$)

3.3 Product Interest Segments

The results reported in sections 3.1 and 3.2 provided insight into the major differences in how people view the various DAECDs. The total respondent analyses also strongly suggested the present of heterogeneity in those perceptions. In the open-ended comments, strong positives and strong negatives were both being discussed. In the attribute ratings, bi-modal response patterns were fairly common.

These observations imply that there exist in the population segments of consumers with strongly divergent views about the products. Before these differences could be analyzed in detail, it was necessary to identify the segments.

The procedure used in this research was for Wharton and Cullen to independently read and evaluate every interview write-up. For each respondent and DAECD separately, the respondent was judged to have either "no interest", "ambivalent interest", or "positive interest".

It should be noted that the authors had originally planned to use responses from the overall rating of two questions (perceptions of the usefulness of the device and intentions to purchase the device) in defining the product interest segments. These items were not used, however, because they tended to be excessively unreliable. Analyses of individual responses tended to show consistent and interpretable patterns for the open-ended comments and the diffusion factor ratings. This consistency was not observed in the overall ratings.

The authors retrospectively hypothesized that because of the newness of the product information, the respondents needed the open-ended discussion in order to formulate their own points of view. The overall ratings were, unfortunately, gathered before the open-ended discussion. In contrast, all other questions were answered after the open-ended discussion.

The observed unreliability of the overall ratings, fortunately did not seriously affect the study. The judges found it reasonably easy to identify which product interest segment an individual belonged to based on the character of their open-ended discussion comments.

Table 3.3.1 reports the number of respondents who were classified into each interest level category. This is reported separately for each DAECD. Based on the number of respondents with positive interest, the rank order of popularity was:

- Low Flow Shower heads (n = 174)
- Set Back Thermostats (n = 128)
- Auto Gas Saving Devices (n = 126)
- Water Heater Timers (n = 90)
- Shower Flow Restrictors (n = 80)
- Flue Heat Recovery Devices (n = 56)
- Furnace Flue Dampers (n = 35)

TABLE 3.3.1

LEVEL OF PRODUCT INTEREST

	Interest Level[1]			
Type of DAECD	No Interest	Ambivalent Interest	Positive Interest	Total Respondents
Water Heater Timers	212 (52.7%)	100 (24.9%)	90 (22.4%)	402 (100.0%)
Shower Flow Restrictors	220 (54.7%)	102 (25.4%)	80 (19.9%)	402 (100.0%)
Low Flow Showerheads	147 (36.6%)	81 (20.1%)	174 (43.3%)	402 (100.0%)
Setback Thermostats	211 (52.5%)	63 (15.7%)	128 (31.8%)	402 (100.0%)
Furnace Flue Dampers	185 (46.0%)	182 (45.3%)	35 (8.7%)	402 (100.0%)
Flue Heat Recovery Devices	155 (38.6%)	191 (47.5%)	56 (13.9%)	402 (100.0%)
Auto Gas Saving Devices	146 (36.3%)	130 (32.3%)	126 (31.3%)	402 (100.0%)

---

1. Level of interest based on evaluations of the open-ended discussions about the DAECDs.

In research projects it is not uncommon to find that the people who are positive in one area are also positive in other areas. Table 3.3.2 reports the number of DAECDs for which individual respondents had positive interest. As can be noted, most frequently respondents were only interested in one DAECD, though interest in two or three DAECDs was not uncommon.

Table 3.3.3 reports dual-product positive interest. This table investigates the extent to which the different DAECDs are appealing to the same target markets. Two pairs of devices had particularly high percentages of dual-interest:

- Shower Flow Restrictors and Low Flow Showerheads. (Dual-interest of the Low Flow Showerhead tended to be high with all devices. This was due to the general popularity of the Low Flow Showerhead. The Shower Flow Restrictor had the highest percent dual-interest of all the devices.)
- Auto Gas Saving Devices and the Flue Heat Recovery Devices.

TABLE 3.3.2

MULTIPLE-PRODUCT POSITIVE INTEREST

Number of DAECDs with Positive Interest:	Total Respondents #	Total Respondents %
0	83	20.6
1	123	30.6
2	79	19.7
3	73	18.2
4	32	8.0
5	11	2.7
6	1	0.2
7	0	0.0
Total	402	100.0

TABLE 3.3.3

DUAL-PRODUCT POSITIVE INTEREST

	Have Positive Interest in DAECD			
	Water Heater Timers	Shower Flow Restrictors	Low Flow Showerheads	Setback Thermostats
# with positive interest...	90	80	174	128
In addition, have positive interest in:				
Water Heater Timers	-	25 (31.2%)	45 (25.9%)	39 (30.5%)
Shower Flow Restrictors	25 (27.8%)	-	60 (34.5%)	31 (24.2%)
Low Flow Showerheads	45 (50.0%)	60 (75.0%)	-	71 (55.5%)
Setback Thermostats	39 (43.3%)	31 (38.8%)	71 (40.8%)	-
Furnace Flue Dampers	10 (11.1%)	4 (5.0%)	23 (13.2%)	14 (10.9%)
Flue Heat Recovery Devices	13 (14.4%)	10 (12.5%)	24 (13.8%)	27 (21.1%)
Auto Gas Saving Devices	31 (34.4%)	31 (38.8%)	65 (37.4%)	45 (35.2%)

TABLE 3.3.3 (continued)

DUAL-PRODUCT POSITIVE INTEREST

	Have Positive Interest in DAECD		
	Furnace Flue Dampers	Flue Heat Recovery Devices	Auto Gas Saving Devices
# with positive interest...	35	56	126
In addition, have positive interest in:			
Water Heater Timers	10 (28.6%)	13 (23.2%)	31 (24.6%)
Shower Flow Restrictors	4 (11.4%)	10 (17.9%)	31 (24.6%)
Low Flow Showerheads	23 (65.7%)	24 (42.9%)	65 (51.6%)
Setback Thermostats	14 (40.0%)	27 (48.2%)	45 (35.7%)
Furnace Flue Dampers	-	5 (8.9%)	11 (8.7%)
Flue Heat Recovery Devices	5 (14.3%)	-	28 (22.2%)
Auto Gas Saving Devices	11 (31.4%)	28 (50.0%)	-

4.0 IN-DEPTH ANALYSIS OF WATER HEATER TIMER INTEREST SEGMENTS

A Water Heater Timer is a device which controls the heating of water throughout the day. It cycles the heater on only at times of the day when hot water is normally needed. As stated on the information sheet provided to respondents, the manufacturers of these devices claim: (1) a saving of $5 per month; (2) a cost of $30; and (3) do-it-yourself installation (but they may want to call an electrician).

4.1 Open-Ended Comments

Comments volunteered by respondents during open-ended discussion were classified into eight categories (savings comments, price comments, installation comments, product performance comments, life style comments, simplicity comments, "need more information" comments, and believability comments). Each comment was also classified as to whether the comment was negative or positive. (See Appendix A for a selection of representative comments.)

- The positive interest segment primarily volunteered comments about the savings the device could provide.
- To a lesser extent the positive interest segment appreciated the price, the ease of installation, and the way the device would control the water temperature automatically.
- The positive interest segment also occasionally mentioned that using the device would not interfere with their life style, often because everyone was away from the house all day.
- The no interest segment felt strongly that the device would interfere with their life style. They emphatically stated that they needed hot water all day long.
- To a much lesser extent the no interest segment also doubted that the device could really save much energy.
- The ambivalent interest segment tended to make fewer comments and, in general, to avoid the extremes of the other two segments.

TABLE 4.1

OPEN-ENDED COMMENTS ABOUT WATER HEATER TIMERS

	Level of Product Interest					
	No Interest		Ambivalent Interest		Positive Interest	
Number of Respondents	212		100		90	
	%		%		%	
Savings Comments:						
Negative Mention	34.4	**	22.0	**	1.1	**
No Mention	51.9		48.0	**	22.2	**
Positive Mention	13.7	**	30.0	**	76.7	**
Price Comments:						
Negative Mention	1.4		2.0		0.0	
No Mention	96.2		94.0	**	75.6	**
Positive Mention	2.4		4.0	**	24.4	**
Installation Comments:						
Negative Mention	2.8	**	6.0	**	1.1	
No Mention	94.3	**	88.0	**	67.8	**
Positive Mention	2.8	*	6.0	**	31.1	**
Product Performance Comments:						
Negative Mention	5.7		5.0	*	1.1	**
No Mention	93.4		90.0	**	71.1	**
Positive Mention	0.9	**	5.0	**	27.8	**

**Statistically significantly at $\alpha < .05$
* Statistically significantly at $\alpha < .10$

TABLE 4.1 (continued)

OPEN-ENDED COMMENTS ABOUT WATER HEATER TIMERS

	Percent Mention By Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents	212		100		90
	%		%		%
Life Style Comments:					
Negative Mention	73.6	——**——	19.0	——**——	5.6
	└──────		──**──		──────┘
No Mention	25.5	——**——	78.0	——*——	71.1
	└──────		──**──		──────┘
Positive Mention	0.9		3.0	——**——	23.3
	└──────		──**──		──────┘
Simplicity Comments:					
Negative Mention	0.5		2.0		0.0
No Mention	99.5		97.0		95.6
	└──────		──**──		──────┘
Positive Mention	0.0		1.0		4.4
	└──────		──**──		──────┘
Need More Information Comments:					
Negative Mention	3.8		5.0		7.8
	└──────		──**──		──────┘
No Mention	96.2		95.0		92.2
Positive Mention	0.0		0.0		0.0
Believability Comments:					
Negative Mention	10.4		8.0		7.8
No Mention	89.6		92.0		92.2
Positive Mention	0.0		0.0		0.0

**Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

4.2 Diffusion Factors

Respondents were asked to rate the Water Heater Timer on a number of product attributes which relate to various new product diffusion factors (relative advantage, life style compatibility, simplicity, communicability, and trialability). For each attribute separately, the average ratings by the product interest segments were computed. The extent of the differences among the three interest segments was tested using analyses of variance. The F-statistic, along with the three average ratings, is reported for each attribute in Table 4.2. The larger the F-value, the more distinctly different the three interest segments are on the attribute.

The major findings concerning the attribute ratings for the Water Heater Timer are as follows:

- The life style compatibility factor, including the attributes of upsetting the daily routine (F=39.77) and inconvenience for the family (F=36.78), is the major factor affecting the diffusion of Water Heater Timers.
- The positive interest setment, much more than the other two segments, thought their friends would be interested in the device.
- The positive interest segment rated relative advantage (primarily good saving, and good price) higher than did the other two segments.
- To a lesser extent, the positive interest segment rated the simplicity and trialability attributes higher than did the no interest and the ambivalent interest segments.

TABLE 4.2

PERCEPTIONS OF WATER HEATER TIMERS
RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	212	100	90	
Relative Advantage Attributes[1]				
"This device would soon pay for itself."	3.35	3.63	3.90	13.30**
"I doubt this device could save the amount of energy claimed." (reverse scored)	2.92	2.99	3.45	11.09**
"It would be hard to determine how much energy this device saves." (reverse scored)	2.66	2.63	3.08	8.25**
"This device appears to be priced reasonably, given the claimed savings."	3.71	3.75	4.03	6.24**
"This device costs too much for the amount of energy it can save." (reverse scored)	3.51	3.63	3.91	7.31**
"The price of this device is too high for me to consider purchasing it." (reverse scored)	3.58	3.72	3.94	6.60**
"This device seems easy to install."	3.65	3.71	3.77	0.77
"This device should fit easily with my (car, furnace, shower, water heater)."	3.67	3.54	3.86	3.69**

---

[1] All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$

TABLE 4.2 (continued)

PERCEPTIONS OF WATER HEATER TIMERS
RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	212	100	90	
Life Style Compatibility Attributes[1]				
"The use of this device might upset our daily household routine." (reverse scored)	2.73	3.47	3.88	39.77**
"Using this device would be inconvenient for my family." (reverse scored)	2.83	3.55	3.86	36.78**
Simplicity Attributes[1]				
"I understand how this device is supposed to work."	3.93	3.96	4.02	0.63
"This device appears to be complicated." (reverse scored)	3.77	3.88	4.00	3.78**
Communicability Attributes[1]				
"It would be difficult to explain the operation of this device to my friends." (reverse scored)	3.76	3.62	3.86	2.23
"My friends would be interested in knowing about this device."	3.12	3.26	3.77	20.07**
Trialability Attributes[1]				
"The inability to try this device prior to purchase would make me hesitant to buy it." (reverse scored)	3.00	3.08	3.32	3.23**
"I find it difficult to judge how useful this device would be because I cannot try it out in advance." (reverse scored)	2.87	2.87	3.20	4.11**

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$

4.3 Energy Conservation Scales

Respondents were asked to rate themselves on three energy conservation scales: (1) "conservation ethic" scale; (2) "motivation to conserve" scale; and (3) "energy conserver" scale. Each of these scales was measured by self-ratings on several different items.

Average self-ratings on the items in the energy conservation scales for the three product interest segments for the Water Heater Timer are shown in Table 4.3. F-values from analyses of variance for the self-rated energy conservation items are also reported.

Highlights of the findings in Table 4.3 include:

- The positive interest segment claimed to accept the conservation ethic much more so than did the negative interest segment.
- The ambivalent interest segment and the positive interest segment were about equal in their acceptance of the conservation ethic.
- With the exception of claims of turning lights off whenever possible, the positive interest segment did not differ importantly from the ambivalent interest segment or the negative interest segment on items for either the "motivation to conserve" scale or the "energy consumer" scale.

TABLE 4.3

INTEREST GROUPS FOR WATER HEATER TIMERS
SELF-RATING ON ENERGY CONSERVATION SCALE

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	212	100	90	
Conservation Ethic Scale[1]				
"By conserving energy in the home I feel I am a better citizen."	3.52	3.62	3.83	4.35**
"I pay attention to energy efficiency ratings when shopping for appliances."	3.21	3.46	3.46	3.44**
"By conserving energy at home I also help prevent pollution."	3.50	3.74	3.67	3.67**
"Conserving energy will save me money in the long run".	4.10	4.22	4.28	3.37**
Motivation to Conserve Scale[1]				
"It would be hard for me to cut down on the use of energy in my home."	3.45	3.37	3.51	0.53
"There is not much the average citizen can do to save energy."	3.89	3.75	3.96	1.54
"If I knew what to do I could save quite a bit of energy bills."	3.28	3.28	3.51	2.62*
Energy Conserver Scale[1]				
"I try to drive less now than in the past."	3.06	3.17	3.14	0.37
"I keep my thermostat lower than I did in past years."	3.37	3.41	3.54	0.84
"I turn lights off in my house whenever possible."	3.93	4.06	4.17	3.36**
"In the winter I turn my thermostat down at night."	3.58	3.41	3.72	1.78

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

4.4 Life Style Scales

Respondents were asked to rate themselves on a number of general life style scales. Each of these scales was measured by self-ratings on several different items. Average self-ratings for the three product interest segments for the Water Heater Timer are shown in Table 4.4. F-values from analyses of variance for the self-rating items are also reported.

In general the results show few life style correlates to interest in the Water Heater Timer. Other than several isolated items with statistically significant differences, only the "community minded" scale showed a systematic pattern of differences. Specifically, the "no interest" segment rated themselves consistently lower than the other two segments on the "community minded" scale.

TABLE 4.4

INTEREST GROUPS FOR WATER HEATER TIMERS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	212	100	90	
Price Conscious Scale[1]				
"I shop a lot for 'specials'."	3.55	3.67	3.61	0.49
"I find myself checking prices in the store for even small items."	3.85	3.81	3.89	0.19
"I usually watch the advertisements for announcements of sales."	3.63	3.73	3.90	2.67*
"A person can save a lot of money by shopping around for bargains."	3.84	3.83	3.77	0.18
Homebody Scale[1]				
"I would rather spend a quiet evening at home than go out to a party."	3.32	3.16	3.26	0.92
"I like parties where there is lots of music and talk." (reverse scored)	2.99	2.94	2.85	0.57
"I am a homebody."	3.24	3.35	3.27	0.40
Community Minded Scale[1]				
"I am an active member of more than one service organization."	2.54	2.91	2.76	4.97**
"I do volunteer work for a hospital or service organization on a fairly regular basis."	2.53	2.71	2.83	2.58*
"I like to work on community projects."	2.98	3.26	3.42	7.86**

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 4.4 (Continued)

INTEREST GROUPS FOR WATER HEATER TIMERS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	212	100	90	
Credit User Scale[1]				
"I buy many things with a credit card or a charge card."	2.73	2.55	2.82	1.29
"I like to pay cash for everything I buy." (reverse scored)	2.52	2.32	2.45	1.21
"It is good to have charge accounts."	3.01	3.00	3.10	0.27
"To buy anything, other than a house or a car, on credit is unwise." (reverse scored)	2.75	2.76	2.89	0.48
Self-Confident Scale[1]				
"I think I have more self-confidence than most people."	3.25	3.17	3.30	0.60
"I am more independent than most people."	3.51	3.50	3.61	0.45
"I think I have a lot of personal ability."	3.66	3.53	3.75	2.45*
"I like to be considered a leader."	3.01	2.91	3.11	1.13
Opinion Leader Scale[1]				
"My friends or neighbours often come to me for advice."	3.00	2.99	3.08	0.30
"I sometimes influence what my friends buy."	3.21	3.00	3.17	1.47
"People come to me more often than I go to them about products."	3.01	3.12	2.96	0.95

---

1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

* Statistically significant at $\alpha < .10$

TABLE 4.4 (Continued)

INTEREST GROUPS FOR WATER HEATER TIMERS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	212	100	90	
Information Seeker Scale[1]				
"I often seek out the advice of my friends regarding which product to buy."	2.96	3.11	2.89	1.24
"I spend a lot of time talking with my friends about products and brands."	2.73	2.88	2.84	0.96
"My neighbors or friends ussually give me good advice on which products to buy."	3.04	3.02	2.89	0.97
New Brand Trier Scale[1]				
"I often try new products before my friends and neighbours do."	2.87	3.09	3.02	2.24
"I like to try new and different things."	3.47	3.59	3.63	1.30
Financially Satisfied Scale[1]				
"Our family income is high enough to satisfy nearly all of our important desires."	3.66	3.57	3.77	1.12
"No matter how fast our income goes up, we never seem to get ahead." (reverse scored)	2.99	2.97	2.92	0.12
"I wish we had a lot more money." (reverse scored)	2.49	2.45	2.30	0.99
Financial Optimist Scale[1]				
"I will probably have more money to spend next year than I have now."	3.02	2.82	3.08	1.80
"Five years from now our family income will probably be a lot higher than it is now."	3.41	3.10	3.58	6.08**

---

1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$

TABLE 4.4 (Continued)

INTEREST GROUPS FOR WATER HEATER TIMERS SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	212	100	90	
Gadgeter Scale[1]				
"I think mechanical gadgets are fun."	3.08	3.24	3.17	0.93
"I enjoy buying mechanical gadgets."	2.67	3.00	2.81	3.71**
Concern for Reliability Scale[1]				
"I won't buy a major appliance unless it has a good warranty."	3.97	3.91	4.00	0.31
"I think energy conserving devices are dependable."	3.17	3.40	3.42	5.19**
Trust in System Scale[1]				
"Most big companies are only out to make a profit." (reverse scored)	2.35	2.46	2.45	0.58
"In my opinion we are facing energy shortages now."	3.34	3.30	3.46	0.64
"It is against the law to make false claims in advertising."	4.14	4.13	4.32	2.34*

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

4.5 Demographics and Household Characteristics

Respondents were asked to complete a questionnaire in which they provided basic demographic data as well as fairly detailed data on the characteristics of their household. These data are summarized in Table 4.5 with those respondents indicating no interest, ambivalence, or positive interest towards the Water Heater Timer reported as three separate groups.

The information provided in Table 4.5 permits the following observations:

- There appeared to be a greater preference for Water Heater Timers among those with electric water heaters as opposed to those with natural gas water heaters. (Note: this is probably due to respondent confusion. The timer is electric and this was indicated on the information sheets. Some respondents thought that this meant that the timer was only for use on electric water heaters).

- In general, household characteristics did not appear to be very strongly linked to either positive or negative comments about the Water Heater Timer.

- Larger families (4 or more) were more likely to have an opinion, either positive or negative, about the device than to be ambivalent.

- Older people were far more likely to be ambivalent about the device than were younger people.

- Males were less likely to talk positively about the Water Heater Timer than were females.

- Less educated people were less likely to express an opinion about the device.

- Employment, household income and all other demographic measures provided very little additional information.

TABLE 4.5

WATER HEATER TIMER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	212		100		90
	%		%		%
Ownership of House:					
Own the house	96.6	——**——	92.8		95.6
Rent the house	3.4	——**——	7.2		4.4
Number of Rooms in the House:					
Three or less	3.9		2.1		1.1
4-5 rooms	37.2		43.2	——*——	34.8
6-7 rooms	40.6	——*——	33.7		41.6
8-9 rooms	13.0	——*——	18.9		16.9
10 or more	5.3	——*——	2.1		5.6
Number of Floors in the House:					
One floor	54.8		59.8		54.4
1 1/2 floors	12.0		10.3		7.8
2 floors	26.4		22.7	——*——	31.1
3 or more	6.7		7.2		6.7
Direction House Faces:					
North	32.5		28.1		23.6
	└────	────	──**──	────	────┘
South	31.6		36.5	——**——	27.0
East	20.4		19.8	——*——	28.1
	└────	────	──**──	────	────┘
West	15.5		15.6		21.3

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 4.5 (continued)

WATER HEATER TIMER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	212	100	90
	%	%	%
Type of Heating Fuel:			
Natural gas	90.4	89.8	84.3
	└────	*	────┘
Heating oil	5.8	3.1	5.6
Electric	2.5	5.0 —*—	8.9
	└────	**	────┘
Other	1.5	2.0	1.1
Type of Hot Water Heater:			
Natural gas	81.3	78.1 —*—	70.8
	└────	**	────┘
Electric	18.8	21.9 —*—	29.2
	└────	**	────┘
Number of Vehicles in Household:			
None	2.9	5.2	3.4
1 Vehicle	46.9	47.4	52.8
2 Vehicles	41.1	40.2	37.1
3 or more	9.2	7.2	6.7

---

[1] Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 4.5 (continued)

WATER HEATER TIMER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	212	100	90
	%	%	%
Annual Heating Bill:			
Under $200	1.1	3.8	4.9
$201 - 300	7.3	7.5	6.2
$301 - 400	18.1	13.8 ——*——	19.8
$401 - 500	28.8 ——*——	36.3 ——*——	27.2
$501 - 600	17.5	13.8	17.3
$601 - 700	12.4	13.8	14.8
$701 - 800	4.5 ——**——	8.8 ——**——	3.7
$801 - 900	6.2 ——**——	1.3	3.7
Over $900	4.0	1.3	2.5
Annual Electric Bill:			
Under $100	1.1	3.7	3.7
$101 - 200	16.1 ——**——	24.7 ——**——	14.6
$201 - 300	32.8	33.3	32.9
$301 - 400	29.9 ——**——	22.2	28.0
$401 - 500	11.5	12.3	8.5
Over $500	8.6 ——**——	3.7	12.2

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 4.5 (continued)

WATER HEATER TIMER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	212	100	90
	%	%	%
Household Vehicle Gasoline Bill:			
Under $100	1.8 ——**——	5.5 ——*——	1.3
$101 - 200	1.8 ——**——	5.5	7.6
	└——————	**——————	——┘
$201 - 300	7.3	11.0	6.3
$301 - 400	9.1	8.2	7.6
$401 - 500	11.6 ——**——	4.1 ——**——	10.1
$501 - 600	7.3	11.0	15.2
	└——————	**——————	——┘
$601 - 700	7.3	9.6	8.9
$701 - 800	9.8 ——**——	2.7	5.1
	└——————	*——————	——┘
$801 - 900	7.3	6.8	5.1
$901 - 1000	9.8	8.2	10.1
Over $1000	26.8	27.4	22.8
Confidence in Estimate of Fuel Bill:			
Very confident	38.0	38.3	39.3
Somewhat confident	49.7	51.9	44.0
Not very confident	9.5	7.4 ——*——	13.1
Not confident at all	2.8	2.5	3.6
Does Respondent Pay Household Bills:[2]			
Respondent pays bills	58.5	59.0	57.8
Other person pays bills	44.8	46.0	52.2

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

2. Percentages add to more than 100% because many households have more than one person who pays the bills.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 4.5 (continued)

WATER HEATER TIMER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	212		100		90
	%		%		%
Number of People in Household:					
One person	2.9		3.1		1.1
Two	22.5	——**——	33.0	——**——	22.2
Three	22.1		26.8		23.3
Four or Five	47.5	——**——	32.0	——**——	47.8
Six or more	4.9		5.2		5.6
Number of Children Under 18 in Household:					
None	36.7	——**——	53.3	——*——	43.8
One	20.6		19.6		14.6
	└————	————	*	————	————┘
Two	28.1	——**——	17.4	——**——	29.2
Three or four	14.1	——**——	8.7		11.2
Five or more	0.5		1.1		1.1

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[1] Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 4.5 (continued)

WATER HEATER TIMER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	212		100		90
	%		%		%
Age:					
18-24	4.0		4.4		8.0
	└	———	*	———	┘
25-34	30.2	—**—	18.7	—**—	27.6
35-44	28.2	—**—	19.8		26.4
45-54	17.8		17.6		17.2
55-64	11.4	—**—	24.2	—**—	11.5
65 and over	8.4	—**—	15.4	—**—	9.2
Sex:					
Male	47.2		53.3	—**—	43.2
Female	52.8		46.7	—**—	56.8
Education:					
Ten years or less	16.4	—**—	23.9	—**—	13.8
11-13 years	31.8		31.5		39.1
	└	———	*	———	┘
Vocational	20.4		20.7		20.7
Some University	12.4	—**—	6.5		10.3
University graduate	18.9		17.4		16.1

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 4.5 (continued)

WATER HEATER TIMER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	212	100	90
	%	%	%
Employment:			
Employed	57.8	51.1	50.0
	└————	————*————	————┘
Unemployed	5.5	7.6	6.8
Retired	8.0 ——**——	20.7 ——**——	10.2
Housewife	26.6	20.7 ——**——	33.0
Student	0.5	0.0	0.0
Other	1.5	0.0	0.0
Household Income:			
under $5000	1.1	1.3	1.3
$5,000 - 9,999	5.5 ——*——	10.3 ——**——	2.5
$10,000 - 14,999	5.5	3.8 ——**——	8.9
$15,000 - 19,999	6.0 ——**——	15.4	12.7
	└————	————**————	————┘
$20,000 - 24,999	17.5	17.9	16.5
$25,000 - 29,999	23.0 ——**——	14.1	17.7
$30,000 - 34,999	15.3	16.7	19.0
$35,000 - 39,999	5.5	9.0	7.6
$40,000 - 44,999	6.0 ——**——	1.3	3.8
$45,000 - 49,999	5.5	5.1	2.5
Over $50,000	9.3	5.1	7.6

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1. Perçentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$

* Statistically significant at $\alpha < .10$

4.6 Conclusions

The product interest segments for the Water Heater Timers were analyzed in the previous sections in detail using several types of information: open-ended comments; ratings of diffusion factor attributes; self-ratings on energy conservation scales; self-ratings on life style scales; household characteristics; and personal demographics. The following discussion is based on the authors' interpretations of these results.

The no interest segment was composed of a wide variety of individuals who differed among themselves in their life styles, household characteristics, and personal demographics. What they shared in common was primarily a strong dislike for the inconvenience of not having hot water all day. For many of these respondents there was someone at home almost all the time (either many children or wife didn't work). While the no interest individuals tended to view Water Heater Timers as capable of providing some savings on their energy bills, these savings were viewed as trivial when contrasted with the perceived inconvenience. For the most part, therefore, these individuals would be resistant to use of a Water Heater Timer.

The ambivalent interest segment generally viewed the Water Heater Timers in a positive manner. Their hesitation, however, arose mostly from two common concerns. Many of these respondents doubted that they would save very much. This was because many were older, often already retired, and had smaller families. As a consequence, they used relatively little hot water in their household. The second concern was for the inconvenience of not having hot water all day. The level of concern was, however, much milder than for the no interest segment.

Some individuals in the ambivalent interest segment are potential users of a Water Heater Timer. They need information, however, which would address their concerns. Those who use less hot water need to be informed of the cost of keeping water hot. For those who are concerned about the inconvenience, the Water Heater Timers should be positioned as a device to reduce the water temperature at night when hot water is not needed. The extent of successful diffusion of Water Heater Timers among the ambivalent interest segment, however, is unlikely to be great. Their generally lackluster comments and ratings suggest, at best, only marginal opportunities for diffusion among this segment.

In contrast to the no interest segment and the ambivalent interest segment, the positive interest segment was very interested in adopting the Water Heater Timers. They tended to express very positive thoughts about the potential for savings. Many of the positive interest segment had larger families that used lots of hot water and therefore the device could be particularly useful. In contrast to the no interest segment, this larger family tended to be away from home during the day and in consequence the respondents saw the device as posing no particular inconvenience. In addition to the perceived potential for savings, the positive interest segment tended to express more concern for energy conservation generally. However, this concern has not been translated into action.

Overall, the positive interest segment appeared to be very willing to adopt and use Water Heater Timers. However, they also seemed unlikely to go out of their way to do so. Successful diffusion of Water Heater Timers is possible with the positive interest segment, but only if information about the devices is generally available in the market place and if finding the devices is easy.

5.0 IN-DEPTH ANALYSIS OF SHOWER FLOW RESTRICTOR INTEREST SEGMENT

A Shower Flow Restrictor is a pipe segment added between the shower pipe and the shower head. It cuts water usage and thus reduces the amount of hot water used, with minor reductions in shower quality. As stated on the information sheets provided to respondents, the manufacturers of these devices claim: (1) a saving of 12% of water heating bill; (2) a cost of $5 and (3) very simple installation.

5.1 Open-Ended Comments

Comments volunteered by respondents during open-ended discussion were classified into eight categories (savings comments, price comments, installation comments, product performance comments, life style comments, simplicity comments, "need more information" comments, and believability comments). Each comment was also classified as to whether the comment was negative or positive. (See Appendix A for a selection of representative comments.)

Table 5.1 summarizes the types of comments the three Shower Flow Restrictor interest segments volunteered about the device:

- The positive interest segment viewed the claimed savings very favorably. While some of the no interest segment viewed the savings favorably, more of them doubted the savings.
- Almost everyone who mentioned the price of the Shower Flow Restrictor spoke of the price favorably. Significantly more of the possible interest segment, however, mentioned the good price.
- To lesser extent, the same favorable pattern of responses was observed for the installation comments.
- Almost no one spoke favorably of the product performance of the Shower Flow Restrictor, while the no interest and the ambivalent interest segments frequently mentioned the poor performance, the positive interest segment rarely discussed

the product performance.

- Life style comments were moderately frequently volunteered. The no interest segment tended to volunteer comments that they don't shower a lot and therefore do not need the device. In contrast, the positive interest segment said they showered a lot (or had a large family that showered a lot) and that therefore the device would be very useful.

- To a small extent, both the positive interest and the ambivalent interest segments expressed a need for more information about the Shower Flow Restrictors.

- Usually the ambivalent interest segment tended to respond intermediately between the no interest and the positive interest segments. However the ambivalent interest segment was much more likely to doubt the believability of the manufacturer's claims than were either of the other two segments.

TABLE 5.1

OPEN-ENDED COMMENTS ABOUT SHOWER FLOW RESTRICTORS

	Level of Product Interest					
	No Interest		Ambivalent Interest		Positive Interest	
Number of Respondents	220		102		80	
	%		%		%	
Savings Comments:						
Negative Mention	36.8	**	8.8		5.0	**
No Mention	51.8	**	39.2	**	12.5	**
Positive Mention	11.4	**	52.0	**	82.5	**
Price Comments:						
Negative Mention	0.0	**	3.9	*	0.0	
No Mention	88.2	**	66.7	**	48.8	**
Positive Mention	11.8	**	29.4	**	51.3	**
Installation Comments:						
Negative Mention	0.5		1.0		1.3	
No Mention	93.6	**	77.5	**	63.8	**
Positive Mention	5.9	**	21.6	**	35.0	**
Product Performance Comments:						
Negative Mention	31.4	**	27.5	**	2.5	**
No Mention	68.2		72.5	**	90.0	**
Positive Mention	0.5		0.0	**	7.5	**

**Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 5.1 (continued)

OPEN-ENDED COMMENTS ABOUT SHOWER FLOW RESTRICTORS

	Percent Mention By Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents	220		102		80
	%		%		%
Life Style Comments:					
Negative Mention	29.5	----**----	8.8	----**----	1.3
	└		**		┘
No Mention	70.5	----**----	90.2	----**----	80.0
	└		**		┘
Positive Mention	0.0		1.0	----**----	18.8
	└		**		┘
Simplicity Comments:					
Negative Mention	1.8		2.0		0.0
No Mention	97.3		97.1		96.3
Positive Mention	0.9		1.0		3.8
Need More Information Comments:					
Negative Mention	0.9	----**----	10.8		11.3
	└		**		┘
No Mention	99.1	----**----	89.2	----**----	88.8
	└		**		┘
Positive Mention	0.0		0.0		0.0
Believability Comments:					
Negative Mention	9.5	----**----	20.6	----**----	3.8
	└		**		┘
No Mention	90.5	----**----	79.4	----**----	96.3
	└		**		┘
Positive Mention	0.0		0.0		0.0

**Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

5.2 Diffusion Factors

Respondents were asked to rate the Shower Flow Restrictor on a number of product attributes which relate to various diffusion factors (relative advantage, life style compatability, simplicity, communicability and trialability). For each attribute separately, the average ratings by the product interest segments were computed. The extent of the differences among the three interest segments was tested using analysis of variance. The F-statistic, along with the three average ratings, is reported for each attribute in Table 5.2. The larger the F-value, the more distinctly different the three interest segments are on the attribute.

The major findings concerning the attribute ratings for the Shower Flow Restrictor are as follows:

- The product interest segments tended to differ on all attributes in the expected direction (the no interest segment less favorably and the positive interest segment more favorably). In general these differences were statistically significant but only moderate in magnitude.
- The life style compatibility attribute of inconvenience for the family (F=11.52) showed the greatest distinctions among the interest segments.
- At the other extreme, all three segments had equivalently positive perceptions as to the ease of installation and the ease of understanding how the device works.

TABLE 5.2

PERCEPTIONS OF SHOWER FLOW RESTRICTORS RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	220	102	80	
Relative Advantage Attributes[1]				
"This device would soon pay for itself."	3.58	3.81	3.99	7.56**
"I doubt this device could save the amount of energy claimed." (reverse scored)	2.86	3.07	3.30	7.08**
"It would be hard to determine how much energy this device saves." (reverse scored)	2.44	2.74	2.81	6.97**
"This device appears to be priced reasonably, given the claimed savings."	3.92	4.04	4.06	1.63
"This device costs too much for the amount of energy it can save." (reverse scored)	3.89	4.07	4.09	3.24**
"The price of this device is too high for me to consider purchasing it." (reverse scored)	3.91	4.00	4.19	3.78**
"This device seems easy to install."	4.09	4.12	4.21	0.99
"This device should fit easily with my (car, furnace, shower, water heater)."	3.90	3.88	3.98	0.39

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[1] All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$

TABLE 5.2 (continued)

PERCEPTIONS OF SHOWER FLOW RESTRICTORS RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	220	102	80	
Life Style Compatibility Attributes[1]				
"The use of this device might upset our daily household routine." (reverse scored)	3.64	3.66	3.99	4.41**
"Using this device would be inconvenient for my family." (reverse scored)	3.53	3.54	4.10	11.52**
Simplicity Attributes[1]				
"I understand how this device is supposed to work."	3.91	3.82	4.00	1.28
"This device appears to be complicated". (reverse scored)	4.03	4.01	4.24	3.57**
Communicability Attributes[1]				
"It would be difficult to explain the operation of this device to my friends." (reverse scored)	3.69	3.78	4.04	5.16**
"My friends would be interested in knowing about this device."	3.08	3.31	3.46	6.11**
Trialability Attributes[1]				
"The inability to try this device prior to purchase would make me hesitant to buy it." (reverse scored)	3.10	3.29	3.48	4.22**
"I find it difficult to judge how useful this device would be because I cannot try it out in advance." (reverse scored)	2.81	3.09	3.30	7.32**

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$

5.3 Energy Conservation Scales

Respondents were asked to rate themselves on three energy conservation scales: (1) "conservation ethic" scale; (2) "motivation to conserve" scale; and (3) "energy conserver" scale. Each of the scales was measured by self-ratings on several different items.

Average self-ratings on the items in the energy conservation scales for the three Shower Flow Restrictor interest segments are shown in Table 5.3. F-values from analyses of variance for the self-rated energy conservation items are also reported.

There are a few differences in the energy conservation attitudes and behaviors among the three Shower Flow Restrictor interest segments. What differences do exist highlight how the ambivalent interest segment differs from the other two interest segments:

- The ambivalent interest segment was much more likely to believe they could reduce energy bills if only they knew how.
- The ambivalent interest segment was less likely to claim that they drive less now.

TABLE 5.3

INTEREST GROUPS FOR SHOWER FLOW RESTRICTORS SELF-RATING ON ENERGY CONSERVATION SCALE

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	220	102	80	
Conservation Ethic Scale[1]				
"By conserving energy in the home I feel I am a better citizen."	3.61	3.65	3.59	0.13
"I pay attention to energy efficiency ratings when shopping for appliances."	3.30	3.31	3.41	0.34
"By conserving energy at home I also help prevent pollution."	3.63	3.60	3.49	0.98
"Conserving energy will save me money in the long run".	4.19	4.14	4.15	0.26
Motivation to Conserve Scale[1]				
"It would be hard for me to cut down on the use of energy in my home."	3.42	3.46	3.49	0.21
"There is not much the average citizen can do to save energy."	3.89	3.87	3.86	0.03
"If I knew what to do I could save quite a bit of energy bills."	3.23	3.61	3.25	6.68**
Energy Conserver Scale[1]				
"I try to drive less now than in the past."	3.17	2.88	3.22	3.19**
"I keep my thermostat lower than I did in past years."	3.46	3.43	3.30	0.73
"I turn lights off in my house whenever possible."	4.03	4.02	3.98	0.17
"In the winter I turn my thermostat down at night."	3.57	3.59	3.56	0.02

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$

5.4 Life Style Scales

Respondents were asked to rate themselves on a number of general life style scales. Each of these scales was measured by self-ratings on several different items. Average self-ratings for the three product interest segments for the Shower Flow Restrictor are shown in Table 5.4. F-values from analyses of variances for the self-rated items are also reported.

The life style comparisons among the three Shower Flow Restrictor interest segments show little in the way of systematic differences. The only consistent result is for the "gadgeter" scale. The positive interest segment is likely to be less interested in gadgets for the home.

TABLE 5.4

INTEREST GROUPS FOR SHOWER FLOW RESTRICTORS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	220	102	80	
Price Conscious Scale[1]				
"I shop a lot for 'specials'."	3.58	3.50	3.75	1.49
"I find myself checking prices in the store for even small items."	3.86	3.82	3.84	0.06
"I usually watch the advertisements for announcements of sales."	3.70	3.77	3.71	0.18
"A person can save a lot of money by shopping around for bargains."	3.82	3.79	3.85	0.09
Homebody Scale[1]				
"I would rather spend a quiet evening at home than go out to a party."	3.35	3.13	3.24	1.67
"I like parties where there is lots of music and talk." (reverse scored)	3.01	2.90	2.84	0.96
"I am a homebody."	3.34	3.20	3.18	1.00
Community Minded Scale[1]				
"I am an active member of more than one service organization."	2.65	2.60	2.86	1.66
"I do volunteer work for a hospital or service organization on a fairly regular basis."	2.59	2.67	2.74	0.56
"I like to work on community projects."	3.13	3.17	3.15	0.08

---

1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

TABLE 5.4 (Continued)

INTEREST GROUPS FOR SHOWER FLOW RESTRICTORS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	220	102	80	
Credit User Scale[1]				
"I buy many things with a credit card or a charge card."	2.68	2.79	2.68	0.32
"I like to pay cash for everything I buy." (reverse scored)	2.40	2.53	2.49	0.57
"It is good to have charge accounts."	3.04	3.01	3.01	0.04
"To buy anything, other than a house or a car, on credit is unwise." (reverse scored)	2.75	2.85	2.79	0.25
Self-Confident Scale[1]				
"I think I have more self-confidence than most people."	3.25	3.12	3.35	1.79
"I am more independent than most people."	3.51	3.64	3.44	1.32
"I think I have a lot of personal ability."	3.64	3.69	3.61	0.30
"I like to be considered a leader."	3.01	2.96	3.06	0.30
Opinion Leader Scale[1]				
"My friends or neighbours often come to me for advice."	3.00	2.99	3.08	0.34
"I sometimes influence what my friends buy."	3.15	3.05	3.25	0.92
"People come to me more often than I go to them about products."	3.02	3.04	3.02	0.02

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1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

TABLE 5.4 (Continued)

INTEREST GROUPS FOR SHOWER FLOW RESTRICTORS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	220	102	80	
Information Seeker Scale[1]				
"I often seek out the advice of my friends regarding which product to buy."	3.00	2.90	3.03	0.48
"I spend a lot of time talking with my friends about products and brands."	2.74	2.87	2.85	0.78
"My neighbors or friends ussually give me good advice on which products to buy."	3.10	2.85	2.95	2.74*
New Brand Trier Scale[1]				
"I often try new products before my friends and neighbours do."	3.00	2.89	2.92	0.59
"I like to try new and different things."	3.50	3.61	3.54	0.61
Financially Satisfied Scale[1]				
"Our family income is high enough to satisfy nearly all of our important desires."	3.66	3.60	3.76	0.72
"No matter how fast our income goes up, we never seem to get ahead." (reverse scored)	3.03	2.90	2.90	0.70
"I wish we had a lot more money." (reverse scored)	2.43	2.49	2.37	0.31
Financial Optimist Scale[1]				
"I will probably have more money to spend next year than I have now."	2.96	3.06	2.96	0.38
"Five years from now our family income will probably be a lot higher than it is now."	3.31	3.37	3.56	1.92

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[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

* Statistically significant at $\alpha < .10$

TABLE 5.4 (Continued)

INTEREST GROUPS FOR SHOWER FLOW RESTRICTORS SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	220	102	80	
Gadgeter Scale[1]				
"I think mechanical gadgets are fun."	3.25	3.05	2.95	3.19**
"I enjoy buying mechanical gadgets."	2.87	2.72	2.63	1.88
Concern for Reliability Scale[1]				
"I won't buy a major appliance unless it has a good warranty."	3.98	3.90	4.00	0.52
"I think energy conserving devices are dependable."	3.27	3.31	3.29	0.11
Trust in System Scale[1]				
"Most big companies are only out to make a profit." (reverse scored)	2.43	2.42	2.29	0.62
"In my opinion we are facing energy shortages now."	3.34	3.27	3.51	1.28
"It is against the law to make false claims in advertising."	4.19	4.05	4.29	2.61*

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1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

5.5 Demographics and Household Characteristics

Respondents were asked to complete a questionnaire in which they provided basic demographic data as well as fairly detailed data on the characteristics of their household. These data are summarized in Table 5.5, with those respondents indicating no interest, ambivalence or positive interest towards the Shower Flow Restrictor reported as three separate groups.

Analysis of Table 5.5 permits the following observations:

- Household characteristics, in general, proved to be rather uninteresting with respect to the Shower Flow Restrictor.
- Larger families, particularly families with three or four children, tended to speak positively about the device.
- Older people were more likely to react negatively to the device than were younger people.
- Females were far more likely to indicate a positive interest in the Shower Flow Restrictor than were males.
- Individuals who had retired were less likely to respond positively to the device.
- Higher income individuals exhibited a slight tendency to speak more negatively about the Shower Flow Restrictor.

TABLE 5.5

SHOWER FLOW RESTRICTOR INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	220		102		80
	%		%		%
Ownership of House:					
Own the house	95.4		96.9		93.7
Rent the house	4.6		3.1		6.3
Number of Rooms in the House:					
Three or less	1.9		4.0		3.8
4-5 rooms	39.9	---*---	32.3	----*---	40.5
6-7 rooms	38.5		42.4		36.7
8-9 rooms	15.0		18.2	----*---	12.7
10 or more	4.7		3.0		6.3
Number of Floors in the House:					
One floor	54.2		54.5	----*---	62.5
1 1/2 floors	12.0		10.1		7.5
2 floors	27.3		27.3		23.8
3 or more	6.5		8.1		6.3
Direction House Faces:					
North	27.7		28.6		35.0
South	31.0		36.7	---**---	27.5
East	23.5		24.5	---**---	15.0
	------------	------------	**	------------	------------
West	17.8	---**---	10.2	---**---	22.5

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 5.5 (continued)

SHOWER FLOW RESTRICTOR INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	220		102		80
	%		%		%
Type of Heating Fuel:					
Natural gas	90.2	——*——	86.0		88.8
Heating oil	6.0		6.0	——**——	1.3
	└──────	──────	**	──────	──────┘
Electric	2.7	——*——	7.0		6.3
Other	0.9		1.0		3.8
Type of Hot Water Heater:					
Natural gas	79.5		74.5		78.8
Electric	20.5		25.5		21.3
Number of Vehicles in Household:					
None	5.1		3.0		0.0
	└──────	──────	**	──────	──────┘
1 Vehicle	48.4		42.4	——**——	55.7
2 Vehicles	38.1	——**——	47.5	——**——	35.4
3 or more	8.4		7.1		8.9

---

[1] Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 5.5 (continued)

SHOWER FLOW RESTRICTOR INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	220	102	80
	%	%	%
Annual Heating Bill:			
Under $200	2.1	2.5	4.4
$201 - 300	6.3 ---**---	2.5 ---**---	14.7
	\\------------	------------**------------	------------/
$301 - 400	17.3	19.0	16.2
$401 - 500	29.8	32.9	27.9
$501 - 600	16.8	15.2	17.6
$601 - 700	13.1	12.7	14.7
$701 - 800	5.8	6.3 ---*---	2.9
$801 - 900	5.8	5.1 ---**---	0.0
	\\------------	------------**------------	------------/
Over $900	3.1	3.8	1.5
Annual Electric Bill:			
Under $100	2.6	0.0 ---**---	4.3
$101 - 200	17.4	20.5	15.9
$201 - 300	34.2	32.1	30.4
$301 - 400	25.8	30.8	29.0
$401 - 500	10.5	10.3	13.0
Over $500	9.5	6.5	7.2

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 5.5 (continued)

SHOWER FLOW RESTRICTOR INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	220	102	80
	%	%	%
Household Vehicle Gasoline Bill:			
Under $100	4.0 ---**---	0.0	1.5
$101 - 200	4.0	5.5	3.0
$201 - 300	8.0	8.2	7.5
$301 - 400	8.5	8.2	9.0
$401 - 500	9.1	8.2	11.9
$501 - 600	10.2	11.0	9.0
$601 - 700	8.0	8.2	9.0
$701 - 800	7.4	6.8	6.0
$801 - 900	6.3	5.5	9.0
$901 - 1000	9.1	9.6	10.4
Over $1000	25.6	28.8	23.9
Confidence in Estimate of Fuel Bill:			
Very confident	39.9	38.8	33.8
Somewhat confident	48.2	50.0	49.3
Not very confident	8.8	8.8 ---*---	14.1
	------------	------*------	------------
Not confident at all	3.1	2.5	2.8
Does Respondent Pay Household Bills:[2]			
Respondent pays bills	59.1	55.9	60.0
Other person pays bills	45.0	51.0	46.3

---

1. Percentages computed based only on respondents who answered the question. This differed slighly from the total number of respondents (non-response bias of approximately 5% on any particular question).

2. Percentages add to more than 100% because many households have more than one person who pays the bills.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 5.5 (continued)

SHOWER FLOW RESTRICTOR INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	220		102		80
	%		%		%
Number of People in Household:					
One person	4.2	---*---	1.0		0.0
	\------------		*		------------/
Two	27.8		24.2		18.8
	\------------		**		------------/
Three	23.6		24.2		22.5
Four or Five	40.6		43.4	---**---	52.5
	\------------		**		------------/
Six or more	3.8	---*---	7.1		6.3
Number of Children Under 18 in Household:					
None	46.9	---*---	38.9		34.6
	\------------		**		------------/
One	18.4		17.9		21.8
Two	25.6		25.3		26.9
Three or four	8.7	---**---	15.8		16.7
Five or more	0.5		2.1		0.0

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 5.5 (continued)

SHOWER FLOW RESTRICTOR INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	220		102		80
	%		%		%
Age:					
18-24	4.3		3.2	——**——	9.2
25-34	26.2		27.7		27.6
35-44	21.4	——**——	28.7		34.2
	└————		——**——		————┘
45-54	19.0		18.1		13.2
55-64	16.7		12.8		10.5
	└————		——*——		————┘
65 and over	12.4		9.6	——**——	5.3
Sex:					
Male	54.4	——**——	39.4		40.3
	└————		——**——		————┘
Female	45.6	——**——	60.6		59.7
	└————		——**——		————┘
Education:					
Ten years or less	17.8		19.0		15.6
11-13 years	30.3		34.7		40.3
	└————		——**——		————┘
Vocational	21.6		18.9		19.5
Some University	9.1		11.6		13.0
University graduate	21.2		15.8		11.7
	└————		——**——		————┘

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 5.5 (continued)

SHOWER FLOW RESTRICTOR INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	220		102		80
	%		%		%
Employment:					
Employed	55.8	—*—	48.9	—*—	57.1
Unemployed	6.3		5.3		7.8
Retired	14.4	—*—	9.6		6.5
	└	———	**	———	┘
Housewife	22.6	—**—	34.0		28.6
Student	0.0		1.1		0.0
Other	1.0		1.1		0.0
Household Income:					
under $5000	1.0		0.0		2.9
$5,000 - 9,999	7.9	—*—	4.9		1.5
	└	———	**	———	┘
$10,000 - 14,999	7.3		7.4	—**—	0.0
	└	———	**	———	┘
$15,000 - 19,999	10.5	—**—	3.7	—**—	14.7
$20,000 - 24,999	15.2		18.5		22.1
	└	———	*	———	┘
$25,000 - 29,999	13.6	—**—	28.4		26.5
	└	———	**	———	┘
$30,000 - 34,999	17.8	—**—	9.9	—**—	20.6
$35,000 - 39,999	7.9		7.4	—**—	2.9
	└	———	**	———	┘
$40,000 - 44,999	5.2	—**—	1.2	—**—	5.9
$45,000 - 49,999	3.7	—**—	9.9	—**—	1.5
Over $50,000	9.9		8.6	—**—	1.5
	└	———	**	———	┘

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

5.6 Conclusions

The product interest segments for the Shower Flow Restrictors were analyzed in the previous sections in detail using several types of information: open-ended comments; ratings of diffusion factor attributes; self-ratings on energy conservation scales; self-ratings on life style scales; household characteristics, and personal demographics. The following discussion is based on the authors' interpretation of these results.

There were few differences among the three interest segments. The three segments did not importantly differ on any of the life style or energy conservation scales. The average ratings on the diffusion factor attributes were consistent: the positive interest segment rated the device more positively while the no interest segment rated it less positively. However, the differences in the ratings were trivial.

The demographics of the three interest segments were similar in many respects, but there were a few interesting differences. The no interest segment tended to have more males, more older people, and smaller families. The positive interest segment, in contrast, tended to be younger, female, and have larger families.

The greatest differences among the interest segments was in terms of the nature of the comments they volunteered in the open-ended discussions. The no interest segment tended to either not shower much, and therefore not need the device, or to like their showers a lot, and therefore not like the reduction in shower quality. In contrast the positive interest segment respondents tended to have families that showered a lot and to be unconcerned about the reduction in shower quality. The ambivalent interest segment tended to be midway between the no interest segment and the positive interest segment in almost all respects.

The chances for adoption of Shower Flow Restrictors by significant numbers of individuals seem slight. Only 80 out of 402 respondents in this study expressed positive interest (less than 20%) and this interest was mostly quite mild.

6.0 IN-DEPTH ANALYSIS OF LOW FLOW SHOWERHEAD INTEREST SEGMENTS

A Low Flow Showerhead is a replacement showerhead which reduces water flow by as much as 66%. It reduces the amount of hot water used without reducing the forcefulness of the spray. As stated on the information sheets provided to the respondents, the manufacturers of these devices claim (1) savings of 12% of water heating bills; (2) costs from $7 to 27 (depending on the specific showerhead); and (3) easy installation.

6.1 Open-Ended Comments

Comments volunteered by respondents during open-ended discussion were classified into eight categories (savings comments, price comments, installation comments, product performance comments, life style comments, simplicity comments, "need more information" comments, and believability comments). Each comment was also classified as to whether the comment was negative or positive. (See Appendix A for a selection of representative comments.)

Table 6.1 summarizes the types of comments the three Low Flow Showerhead interest segments volunteered about the device:

- The no interest segment found little to like about the Low Flow Showerhead. Many said they did not shower very often (life style negative) and therefore they doubted they could save the amount claimed (savings negative).
- To a lesser degree, a number of no interest segment individuals stated that they couldn't really believe (negative believability) that the Low Flow Showerhead could reduce the water volume and maintain the forcefulness of the spray (product performance negative).
- In contrast, the ambivalent interest segment liked the claimed savings and the price. However they tended to be skeptical about those claims and doubted that the product could maintain

Low Flow Showerhead before they could form an opinion.

- The positive interest segment was favorable to the device in all respects. Rarely did a member of this segment have any reservations. In particular they liked the savings, the price, the ease of installation, and the maintaining of the shower quality.

TABLE 6.1

OPEN-ENDED COMMENTS ABOUT LOW FLOW SHOWERHEADS

	Level of Product Interest					
	No Interest		Ambivalent Interest		Positive Interest	
Number of Respondents	147		81		168	
	%		%		%	
Savings Comments:						
Negative Mention	39.5	**	12.3	**	0.0	**
No Mention	53.1	**	27.2		22.4	**
Positive Mention	7.5	**	60.5	*	77.6	**
Price Comments:						
Negative Mention	4.1	*	8.6	**	1.1	*
No Mention	90.5	**	72.8	**	63.8	**
Positive Mention	5.4	**	18.5	**	35.1	**
Installation Comments:						
Negative Mention	1.4		1.2		0.6	
No Mention	95.9	**	81.5	**	70.1	**
Positive Mention	2.7	**	17.3	**	29.3	**
Product Performance Comments:						
Negative Mention	14.3		19.8	**	5.7	**
No Mention	83.0	**	65.4	**	55.7	**
Positive Mention	2.7	**	14.8	**	38.5	**

**Statistically significant at α < .05
* Statistically significant at α < .10

TABLE 6.1 (continued)

OPEN-ENDED COMMENTS ABOUT LOW FLOW SHOWERHEADS

	Percent Mention By Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents	147		81		168
	%		%		%
Life Style Comments:					
Negative Mention	36.7	----**----	8.6	----**----	1.1
	└		---------**---------		┘
No Mention	63.3	----**----	86.4		87.9
	└		---------**---------		┘
Positive Mention	0.0	----**----	4.9	----**----	10.9
	└		---------**---------		┘
Simplicity Comments:					
Negative Mention	0.7		2.5		0.0
No Mention	99.3		97.5		100.0
Positive Mention	0.0		0.0		0.0
Need More Information Comments:					
Negative Mention	2.0	----**----	12.3	----**----	3.4
No Mention	98.0	----**----	87.7	----**----	96.6
Positive Mention	0.0		0.0		0.0
Believability Comments:					
Negative Mention	14.3		17.3	----**----	10.3
No Mention	85.7		82.7	----**----	88.5
Positive Mention	0.0		0.0		1.1

**Statistically significant at $\alpha < .05$

6.2 Diffusion Factors

Respondents were asked to rate the Low Flow Showerhead on a number of product attributes which relate to various new product diffusion factors (relative advantage, life style compatibility, simplicity, communicability, and trialability). For each attribute separately, the average ratings by the product interest segments were computed. The extent of the differences among the three interest segments was tested using analysis of variance. The F-statistic, along with the three average ratings, is reported for each attribute in Table 6.2. The larger the F-value, the more distinctly different the three interest segments are on the attribute.

The major findings concerning the attribute ratings for the Low Flow Showerhead are as follows:

- Overall there was a consistent pattern of the no interest segment being roughly neutral about the Low Flow Showerheads on the attributes while the positive interest segment tended to be markedly favorable. The ambivalent interest segment tended to average somewhere in between these two extremes.
- The attribute with the greatest distinctions among the interest segments was "my friends would be interested in knowing about this device" (F=25.73).
- Strong distinctions were also observed in savings and life style compatibility.
- An interesting distinction can be observed in "this device should fit easily with my shower....". Based on the open-ended comments, it was clear that much of the concern for this attribute among the no interest segment was volunteered by people who had hand-held shower devices. For those people, the replacement Low Flow Showerhead actually would not fit on their current equipment.

TABLE 6.2

PERCEPTIONS OF LOW FLOW SHOWERHEADS
RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	147	81	174	
Relative Advantage Attributes[1]				
"This device would soon pay for itself."	3.24	3.65	3.80	16.99**
"I doubt this device could save the amount of energy claimed." (reverse scored)	2.70	3.13	3.26	14.14**
"It would be hard to determine how much energy this device saves." (reverse scored)	2.45	2.84	2.82	6.73**
"This device appears to be priced reasonably, given the claimed savings."	3.84	3.76	3.95	2.05
"This device costs too much for the amount of energy it can save." (reverse scored)	3.67	3.81	3.99	7.11**
"The price of this device is too high for me to consider purchasing it." (reverse scored)	3.74	3.76	4.12	10.52**
"This device seems easy to install."	4.09	4.25	4.27	4.48**
"This device should fit easily with my (car, furnace, shower, water heater)."	3.74	4.11	4.12	11.60**

---

1. All attributes were scored such that the higer the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$

TABLE 6.2 (continued)

PERCEPTIONS OF LOW FLOW SHOWERHEADS
RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	147	81	174	
Life Style Compatibility Attributes[1]				
"The use of this device might upset our daily household routine." (reverse scored)	3.77	3.87	4.05	4.86**
"Using this device would be inconvenient for my family." (reverse scored)	3.56	3.63	4.08	15.67**
Simplicity Attributes[1]				
"I understand how this device is supposed to work."	3.84	3.96	3.99	1.63
"This device appears to be complicated." (reverse scored)	3.88	4.05	4.19	10.02**
Communicability Attributes[1]				
"It would be difficult to explain the operation of this device to my friends." (reverse scored)	3.57	3.75	3.84	3.71**
"My friends would be interested in knowing about this device."	3.05	3.37	3.72	25.73**
Trialability Attributes[1]				
"The inability to try this device prior to purchase would make me hesitant to buy it." (reverse scored)	3.03	3.11	3.46	7.28**
"I find it difficult to judge how useful this device would be because I cannot try it out in advance." (reverse scored)	2.81	3.01	3.22	5.69**

---

[1] All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$

6.4 Life Style Scales

Respondents were asked to rate themselves on a number of general life style scales. Each of these scales was measured by self-ratings on several different items. Average self-ratings for the three product interest segments for the Low Flow Showerhead are shown in Table 6.4. F-values from analyses of variance for the self-rated items are also reported.

There were few life style correlates with interest in the Low Flow Showerhead. Two systematic correlates were:

- The positive interest group was less inclined to be homebodies.
- The positive interest group was more likely to claim to be opinion leaders.

TABLE 6.4

INTEREST GROUPS FOR LOW FLOW SHOWERHEADS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	147	81	174	
Price Conscious Scale[1]				
"I shop a lot for 'specials'."	3.56	3.49	3.67	1.04
"I find myself checking prices in the store for even small items."	3.84	3.95	3.81	0.64
"I usually watch the advertisements for announcements of sales."	3.64	3.69	3.79	1.02
"A person can save a lot of money by shopping around for bargains."	3.83	3.81	3.82	0.01
Homebody Scale[1]				
"I would rather spend a quiet evening at home than go out to a party."	3.36	3.24	3.21	1.03
"I like parties where there is lots of music and talk." (reverse scored)	3.08	3.00	2.82	2.74*
"I am a homebody."	3.48	3.13	3.16	4.45**
Community Minded Scale[1]				
"I am an active member of more than one service organization."	2.65	2.63	2.73	0.34
"I do volunteer work for a hospital or service organization on a fairly regular basis."	2.52	2.61	2.76	1.96
"I like to work on community projects."	3.04	3.17	3.22	1.56

---

1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

6.3 Energy Conservation Scales

Respondents were asked to rate themselves on three energy conservation scales: (1) "conservation ethic" scale; (2) "motivation to conserve" scale; and (3) "energy conserver" scale. Each of these scales was measured by self-ratings on several different items.

Average self-ratings on the items in the energy conservation scales for the three Low Flow Showerhead interest segments are shown in Table 6.3. F-values from analyses of variance for the self-rated energy conservation items are also reported.

The highlights of the results in Table 6.3 include:

- There were no strong differences among the interest segments in the extent to which they accepted the conservation ethic.
- The positive interest segment was more likely to feel that they could save money through conservation efforts than were the other two segments.
- The positive interest segment is less likely to claim they already try to conserve energy.

TABLE 6.3

INTEREST GROUPS FOR LOW FLOW SHOWERHEADS SELF-RATING ON ENERGY CONSERVATION SCALE

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	147	81	174	
Conservation Ethic Scale[1]				
"By conserving energy in the home I feel I am a better citizen."	3.70	3.66	3.53	1.72
"I pay attention to energy efficiency ratings when shopping for appliances."	3.30	3.37	3.33	0.15
"By conserving energy at home I also help prevent pollution."	3.64	3.64	3.54	0.65
"Conserving energy will save me money in the long run".	4.21	4.08	4.17	1.18
Motivation to Conserve Scale[1]				
"It would be hard for me to cut down on the use of energy in my home."	3.38	3.33	3.55	2.11
"There is not much the average citizen can do to save energy."	3.78	3.80	3.99	2.77*
"If I knew what to do I could save quite a bit of energy bills."	3.18	3.49	3.39	3.82**
Energy Conserver Scale[1]				
"I try to drive less now than in the past."	3.29	2.93	3.04	3.47**
"I keep my thermostat lower than I did in past years."	3.50	3.43	3.35	0.74
"I turn lights off in my house whenever possible."	4.11	4.07	3.92	2.82*
"In the winter I turn my thermostat down at night."	3.50	3.55	3.64	0.60

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 6.4 (Continued)

INTEREST GROUPS FOR LOW FLOW SHOWERHEADS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Valu
Number of Respondents	147	81	174	
Credit User Scale[1]				
"I buy many things with a credit card or a charge card."	2.56	2.67	2.84	2.41*
"I like to pay cash for everything I buy." (reverse scored)	2.35	2.43	2.55	1.44
"It is good to have charge accounts."	3.05	3.04	3.01	0.07
"To buy anything, other than a house or a car, on credit is unwise." (reverse scored)	2.85	2.75	2.74	0.41
Self-Confident Scale[1]				
"I think I have more self-confidence than most people."	3.23	3.13	3.29	0.98
"I am more independent than most people."	3.50	3.53	3.55	0.12
"I think I have a lot of personal ability."	3.57	3.68	3.70	1.56
"I like to be considered a leader."	2.94	2.99	3.08	1.07
Opinion Leader Scale[1]				
"My friends or neighbours often come to me for advice."	2.89	2.91	3.16	4.27*
"I sometimes influence what my friends buy."	3.07	2.99	3.28	3.09*
"People come to me more often than I go to them about products."	2.97	2.92	3.12	2.02

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1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 6.4 (Continued)

INTEREST GROUPS FOR LOW FLOW SHOWERHEADS SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	147	81	174	
Information Seeker Scale[1]				
"I often seek out the advice of my friends regarding which product to buy."	3.02	3.03	2.92	0.50
"I spend a lot of time talking with my friends about products and brands."	2.71	2.75	2.88	1.41
"My neighbors or friends ussually give me good advice on which products to buy."	3.00	3.03	2.99	0.04
New Brand Trier Scale[1]				
"I often try new products before my friends and neighbours do."	2.90	2.95	3.01	0.54
"I like to try new and different things."	3.45	3.57	3.59	1.12
Financially Satisfied Scale[1]				
"Our family income is high enough to satisfy nearly all of our important desires."	3.64	3.65	3.70	0.18
"No matter how fast our income goes up, we never seem to get ahead." (reverse scored)	3.05	2.81	2.97	1.17
"I wish we had a lot more money." (reverse scored)	2.45	2.48	2.40	0.16
Financial Optimist Scale[1]				
"I will probably have more money to spend next year than I have now."	2.91	3.11	2.99	0.90
"Five years from now our family income will probably be a lot higher than it is now."	3.21	3.47	3.47	3.07**

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1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$

TABLE 6.4 (Continued)

INTEREST GROUPS FOR LOW FLOW SHOWERHEADS SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	147	81	174	
Gadgeter Scale[1]				
"I think mechanical gadgets are fun."	3.21	3.08	3.11	0.51
"I enjoy buying mechanical gadgets."	2.78	2.71	2.82	0.34
Concern for Reliability Scale[1]				
"I won't buy a major appliance unless it has a good warranty."	3.93	4.05	3.95	0.70
"I think energy conserving devices are dependable."	3.21	3.55	3.22	6.35**
Trust in System Scale[1]				
"Most big companies are only out to make a profit." (reverse scored)	2.42	2.37	2.39	0.06
"In my opinion we are facing energy shortages now."	3.16	3.57	3.43	4.95**
"It is against the law to make false claims in advertising."	4.10	4.20	4.23	1.35

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1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$

6.5 Demographics and Household Characteristics

Respondents were asked to complete a questionnaire in which they provided basic demographic data as well as fairly detailed data on the characteristics of their household. These data are summarized in Table 6.5 with those respondents indicating no interest, ambivalence, or positive interest towards the Low Flow Showerhead reported as three separate groups.

The data provided in Table 6.5 permit the following observations:

- Respondents with smaller homes tended to speak negatively about the Low Flow Showerhead whereas respondents with larger homes tended to speak positively about the device. This distinction held true both in terms of number of rooms in the house and in terms of number of floors in the house.
- Respondents with natural gas hot water heaters typically indicated a positive interest in the device whereas those with electric hot water heaters were more likely to indicate no interest in the Low Flow Showerhead.
- Respondents with higher electric bills were more likely to describe the Low Flow Showerhead in positive terms.
- Larger families, and families with children under the age of 18, were far more likely to express a positive interest in the device than were smaller families.
- Younger people were more likely to describe the device positively.
- Females were far more likely to express a positive interest in the Low Flow Showerhead than were males.

TABLE 6.5

LOW FLOW SHOWERHEAD INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	147		81		174
	%		%		%
Ownership of House:					
Own the house	96.5	——**——	90.0	——**——	97.1
Rent the house	3.5	——**——	10.0	——**——	2.9
Number of Rooms in the House:					
Three or less	2.8		2.5		3.0
4-5 rooms	45.5	——**——	29.1		36.1
	└	———	**	———	┘
6-7 rooms	38.5		44.3		37.3
8-9 rooms	11.2	——*——	17.7		17.8
	└	———	**	———	┘
10 or more	2.1	——**——	6.3		5.9
	└	———	**	———	┘
Number of Floors in the House:					
One floor	63.6	——**——	51.9		51.4
	└	———	**	———	┘
1 1/2 floors	11.2		8.9		11.0
2 floors	21.7	——**——	30.4		28.9
	└	———	**	———	┘
3 or more	3.5	——**——	8.9		8.7
	└	———	**	———	┘
Direction House Faces:					
North	32.6		30.0		26.5
	└	———	*	———	┘
South	32.6		28.8		32.4
East	20.6	——*——	27.5	——*——	20.6
West	14.2		13.8	——**——	20.6
	└	———	**	———	┘

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 6.5 (continued)

LOW FLOW SHOWERHEAD INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	147	81	174
	%	%	%
Type of Heating Fuel:			
Natural gas	86.6	88.8	90.8
	└──────	*	──────┘
Heating oil	5.6	5.0	4.6
Electric	4.9	5.1	4.1
Other	2.8	1.3	0.6
Type of Hot Water Heater:			
Natural gas	73.9	75.9 ──*──	82.6
	└──────	**	──────┘
Electric	26.1	24.1 ──*──	17.4
	└──────	**	──────┘
Number of Vehicles in Household:			
None	6.3 ──*──	2.6	1.7
	└──────	**	──────┘
1 Vehicle	51.4	52.6 ──*──	43.9
	└──────	*	──────┘
2 Vehicles	36.6	34.6 ──**──	45.1
	└──────	**	──────┘
3 or more	5.6 ──*──	10.3	9.2
	└──────	**	──────┘

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 6.5 (continued)

LOW FLOW SHOWERHEAD INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	147		81		174
	%		%		%
Annual Heating Bill:					
Under $200	2.4		3.0		2.7
$201 - 300	10.7	—**—	1.5	—**—	6.7
	└	—	*	—	┘
$301 - 400	14.8		19.7		18.7
$401 - 500	32.0		28.8		29.3
$501 - 600	18.9		16.7		14.7
$601 - 700	11.5		15.2		14.0
$701 - 800	4.1		3.0	—**—	7.3
	└	—	*	—	┘
$801 - 900	3.3		6.1		4.7
Over $900	2.4	—*—	6.0	—*—	2.0
Annual Electric Bill:					
Under $100	2.5		1.5		2.7
$101 - 200	19.8		17.9		16.1
$201 - 300	41.3		35.8	—**—	24.8
	└	—	**	—	┘
$301 - 400	24.0		23.9	—*—	32.2
	└	—	**	—	┘
$401 - 500	7.4		11.9		13.4
	└	—	**	—	┘
Over $500	4.9		9.0		10.6
	└	—	**	—	┘

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 6.5 (continued)

LOW FLOW SHOWERHEAD INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	147		81		174
	%		%		%
Household Vehicle Gasoline Bill:					
Under $100	5.4	—*—	1.6		0.7
	└		**		┘
$101 - 200	6.3		6.3	—**—	1.4
	└		**		┘
$201 - 300	8.9		6.3		7.8
$301 - 400	11.6	—**—	1.6	—**—	9.2
$401 - 500	11.6	—**—	4.8	—**—	9.9
$501 - 600	10.7		11.1		9.2
$601 - 700	7.1	—**—	15.9	—**—	5.7
$701 - 800	4.5		6.3		9.2
	└		**		┘
$801 - 900	5.4	—**—	11.1	—*—	5.7
$901 - 1000	7.1		7.9		12.1
	└		**		┘
Over $1000	21.4		27.0		29.1
	└		**		┘
Confidence in Estimate of Fuel Bill:					
Very confident	38.9		43.9	—*—	35.5
Somewhat confident	46.8		48.5		50.7
Not very confident	11.1		7.6		9.9
Not confident at all	3.2		0.0		3.9
Does Respondent Pay Household Bills:[2]					
Respondent pays bills	59.2		53.1		60.3
Other person pays bills	45.6		48.1		47.1

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

2. Percentages add to more than 100% because many households have more than one person who pays the bills.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 6.5 (continued)

LOW FLOW SHOWERHEAD INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	147		81		174
	%		%		%
Number of People in Household:					
One person	6.4	**	0.0		0.6
			**		
Two	35.0	**	20.3		19.2
			**		
Three	22.9		26.6		22.7
Four or Five	33.6	**	43.0	**	52.3
			**		
Six or more	2.1	**	10.1	*	5.2
			*		
Number of Children Under 18 in Household:					
None	55.2	**	37.2		34.5
			**		
One	17.9		20.5		19.0
Two	18.7	*	25.6		31.5
			**		
Three or four	7.5	**	14.1		14.9
			**		
Five or more	0.7		2.6		0.0

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 6.5 (continued)

LOW FLOW SHOWERHEAD INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest					
	No Interest		Ambivalent Interest		Positive Interest	
Number of Respondents[1]	147		81		174	
	%		%		%	
Age:						
18-24	4.4		6.5		4.8	
25-34	21.9		24.7	*	31.9	**
35-44	19.0		23.4	**	32.5	**
45-54	16.1	**	26.0	**	15.1	
55-64	21.9	**	11.7		9.6	**
65 and over	16.8	**	7.8		6.0	**
Sex:						
Male	57.5	**	44.0		41.7	**
Female	42.5	**	56.0		58.3	**
Education:						
Ten years or less	22.4		17.3		13.8	**
11-13 years	31.9		33.3		34.7	
Vocational	20.3		16.0	*	22.8	
Some University	6.5	**	16.0		11.4	**
University graduate	18.8		17.3		17.4	

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 6.5 (continued)

LOW FLOW SHOWERHEAD INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	147		81		174
	%		%		%
Employment:					
Employed	51.5		49.4	—**—	59.0
	└────	────	*	────	────┘
Unemployed	6.6		6.5		6.0
Retired	19.9	—**—	7.8		6.6
	└────	────	**	────	────┘
Housewife	20.6	—**—	36.4	—**—	27.1
	└────	────	*	────	────┘
Student	0.0		0.0		0.6
Other	1.5		0.0		0.6
Household Income:					
under $5000	1.6		1.4		0.7
$5,000 - 9,999	8.9	—**—	4.3		4.1
	└────	────	**	────	────┘
$10,000 - 14,999	8.1		8.7	—**—	2.7
	└────	────	**	────	────┘
$15,000 - 19,999	10.5		10.1		8.8
$20,000 - 24,999	18.5		14.5		17.7
$25,000 - 29,999	18.5		18.8		21.1
$30,000 - 34,999	13.7		14.5		19.7
	└────	────	**	────	────┘
$35,000 - 39,999	4.8	—*—	8.7		7.5
$40,000 - 44,999	4.8		2.9		4.8
$45,000 - 49,999	4.8		2.9		5.4
Over $50,000	5.6	—**—	13.0	—*—	7.5

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at α < .05
* Statistically significant at α < .10

6.6 Conclusions

The product interest segments for the Low Flow Showerheads were analyzed in the previous sections in detail using several types of information: open-ended comments, ratings of diffusion factor attributes; self-ratings on energy conservation scales; self-ratings on life style scales; household characteristics; and personal demographics. The following discussion is based on the authors' interpretations of these results.

The Low Flow Showerheads have the greatest potential for successful diffusion of all the devices tested in this study. There are a number of reasons for this. First, the Low Flow Showerheads had the largest positive interest segment. 174 respondents (out of 402 interviewed) indicated an interest in the device. This is over 40% of all interviews. Second, the individuals in the positive interest segment expressed favorable opinions of the product on all attributes and in their open-ended discussions. They apparently had no reservations or hesitations.

The third reason for the high potential for successful diffusion concerns the demographics and household characteristics of individuals in the positive interest segment. The characteristics of these individuals are quite reasonable as targets for the device. The positive interest respondents tended to be younger, be females with larger families, have larger homes, and generally have higher energy bills.

A fourth reason for the potential for diffusion is that the data indicated a likelihood of developing effective word-of-mouth communications. The positive interest segment was much more likely to rate themselves as being opinion leaders. Furthermore they rated the product as a device their friends would be interested in.

This word-of-mouth communication would also help the Low Flow Showerhead diffuse among the ambivalent interest segment. This segment tended to be positive about the product but wanted confirmation about its performance. Word-of-mouth communications are particularly effective in this type of situation.

Word-of-mouth communication would be less successful with the no interest segment. While some of the individuals in the no interest segment expressed non-interest because of doubts about the device (similar to the ambivalent interest segment), the doubts were fairly emphatic. These individuals would be less willing to respond to word-of-mouth communications.

The bulk of the no interest segment, moreover, were not in the market for a replacement showerhead for a standard shower. Either the respondent did not shower or had no shower or the respondent had a specialty shower (handheld shower or pulsating showerhead). The device was simply inappropriate for these individuals.

The fifth reason for a high potential for successful diffusion deals directly with the character of the product. The Low Flow Showerhead offers savings at a price that most people can afford without difficulty. In addition the device claims to provide this savings without any inconvenience in installation or use.

In summary, the Low Flow Showerhead is likely to diffuse well. This depends, however, on the device living up to its claims of not reducing the forcefulness of the shower. Since word-of-mouth communications are likely to play a significant role in the diffusion process, it is essential for early adopters to make positive statements about the device's performance.

7.0 IN-DEPTH ANALYSIS OF SETBACK THERMOSTAT INTEREST SEGMENTS

A Setback Thermostat is a device which allows the individual to automatically control the thermostat. It automatically reduces the thermostat at specified times of the day or night. As stated on the information sheets provided to the respondents, the manufacturer of these devices claims: (1) savings of 5-15% of the fuel bill (depending on the specific setback device); (2) a cost of $45; and (3) installation which should be done by a trained serviceman.

7.1 Open-Ended Comments

Comments volunteered by respondents during open-ended discussion were classified into eight categories (savings comments, price comments, installation comments, product performance comments, life style comments, simplicity comments, "need to know more" comments, and believability comments). Each comment was also classified as to whether the comment was negative or positive. (See Appendix A for a selection of representative comments.)

Table 7.1 summarizes the types of comments the three Setback Thermostat interest segments volunteered about the device:

- The positive interest segment was strongly impressed with the automatic feature of the device. In particular they liked the idea of the device turning up the temperature before they arose in the morning or before they returned home from work.
- To a lesser extent, the positive interest segment felt the device would help them save. They frequently talked about being inconsistent in manually setting back the thermostat (for example, by forgetting to set it back before retiring for the night) and the automatic feature would prevent that.
- In contrast, the no interest segment was frequently emphatically negative about the device. Many claimed that they already set back the thermostat and that therefore the device would not save them anything. Others disliked the notion of changing the temperature - they wanted their home at a constant temperature 24 hours a day.

TABLE 7.1

OPEN-ENDED COMMENTS ABOUT SETBACK THERMOSTATS

	Level of Product Interest					
	No Interest		Ambivalent Interest		Positive Interest	
Number of Respondents	211		63		128	
	%		%		%	
Savings Comments:						
Negative Mention	73.0	**	22.2	**	3.9	**
No Mention	21.3	**	34.9	*	43.8	**
Positive Mention	5.7	**	42.9	*	52.3	**
Price Comments:						
Negative Mention	10.0		12.7	**	3.9	**
No Mention	87.2		82.5		82.8	
Positive Mention	2.8		4.8	**	13.3	**
Installation Comments:						
Negative Mention	8.1	**	17.5		15.6	**
No Mention	91.0	**	82.5		79.7	**
Positive Mention	0.9		0.0	**	4.7	**
Product Performance Comments:						
Negative Mention	6.2		3.2		3.1	*
No Mention	84.4	**	58.7	**	34.4	**
Positive Mention	9.5	**	38.1	**	62.5	**

**Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 7.1 (continued)

OPEN-ENDED COMMENTS ABOUT SETBACK THERMOSTATS

	Percent Mention By Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents	211		63		128
	%		%		%
Life Style Comments:					
Negative Mention	69.7	----**----	30.2	----**----	5.5
	└	----	**	----	┘
No Mention	28.9	----**----	66.7		71.9
	└	----	**	----	┘
Positive Mention	1.4		3.2	----**----	22.7
	└	----	**	----	┘
Simplicity Comments:					
Negative Mention	0.5		1.6		0.8
No Mention	99.5		96.8		94.5
	└	----	**	----	┘
Positive Mention	0.0		1.6		4.7
	└	----	**	----	┘
Need More Information Comments:					
Negative Mention	3.3	----**----	12.7		9.4
	└	----	**	----	┘
No Mention	96.7	----**----	87.3		90.6
	└	----	**	----	┘
Positive Mention	0.0		0.0		0.0
Believability Comments:					
Negative Mention	10.0		9.5		6.3
	└	----	*	----	┘
No Mention	90.0		88.9		91.4
Positive Mention	0.0		1.6		2.3

**Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

7.2 Diffusion Factors

Respondents were asked to rate the Setback Thermostat on a number of product attributes which relate to various new product diffusion factors (relative advantage, life style compatibility, simplicity, communicability, and trialability). For each attribute separately, the average ratings by the product interest segments were computed. The extent of the differences among the three interest segments was tested using analysis of variance. The F-statistic, along with the three average ratings, is reported for each attribute in Table 7.2. The larger the F-value, the more distinctly different the three interest segments are on the attribute.

The major findings concerning the attribute ratings for the Setback Thermostat are as follows:

- Consistent with the polarity of the comments volunteered in the open-ended discussions, strong differences were observed among the interest segments. The positive interest segment rated the device more favorably on all attributes than did the other two segments.

- The area of greatest difference in the attribute ratings was savings. The no interest segment tended to doubt the claimed savings but the positive interest segment did not.

- Large differences were also observed for the life style compatibility items. The positive interest segment responded very favorably to the use of the device whereas the no interest segment tended, on the average, to rate these attributes more neutrally.

- To a lesser extent (though still quite strongly) the positive interest segment was also more favorable than the no interest segment on the price and ease of installing the device.

- In general, a consistent pattern of results were observed for the relative advantage and the life style compatibility attributes. For these attributes the no interest segment tended to respond neutrally, the positive interest segment tended to respond strongly favorably, and the ambivalent interest segment averaged some between those two polar extremes.

- For the remaining diffusion factors (simplicity, communicability, and trialability) a different pattern emerged. For these attributes, it was the ambivalent interest group that registered the most concern.

- Overall, therefore, the results can be characterized as follows:
  - the positive interest segment understands the device and likes it
  - the no interest segment understands the device and does not like it
  - the ambivalent interest segment is not sure they understand the device.

TABLE 7.2

PERCEPTIONS OF SETBACK THERMOSTATS RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	211	63	128	
Relative Advantage Attributes[1]				
"This device would soon pay for itself."	3.23	3.39	3.83	19.24**
"I doubt this device could save the amount of energy claimed." (reverse scored)	2.83	3.32	3.65	33.83**
"It would be hard to determine how much energy this device saves." (reverse scored)	2.65	3.00	3.21	13.60**
"This device appears to be priced reasonably, given the claimed savings."	3.49	3.47	3.85	8.10**
"This device costs too much for the amount of energy it can save." (reverse scored)	3.36	3.48	3.89	14.88**
"The price of this device is too high for me to consider purchasing it." (reverse scored)	3.24	3.43	3.82	16.15**
"This device seems easy to install."	3.02	2.94	3.32	3.96**
"This device should fit easily with my (car, furnace, shower, water heater)."	3.58	3.62	4.01	12.61**

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[1] All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$

TABLE 7.2 (continued)

PERCEPTIONS OF SETBACK THERMOSTATS
RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	211	63	128	
Life Style Compatibility Attributes[1]				
"The use of this device might upset our daily household routine." (reverse scored)	3.52	3.79	4.02	12.53**
"Using this device would be inconvenient for my family." (reverse scored)	3.37	3.84	4.06	25.70**
Simplicity Attributes[1]				
"I understand how this device is supposed to work."	3.93	3.79	4.03	2.84*
"This device appears to be complicated." (reverse scored)	3.88	3.58	4.05	11.04**
Communicability Attributes[1]				
"It would be difficult to explain the operation of this device to my friends." (reverse scored)	3.70	3.56	3.90	4.91**
"My friends would be interested in knowing about this device."	3.21	3.37	3.82	23.06**
Trialability Attributes[1]				
"The inability to try this device prior to purchase would make me hesitant to buy it." (reverse scored)	3.09	2.97	3.54	10.65**
"I find it difficult to judge how useful this device would be because I cannot try it out in advance." (reverse scored)	2.96	2.73	3.32	8.57**

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

7.3 Energy Conservation Scales

Respondents were asked to rate themselves on three energy conservation scales: (1) "conservation ethic" scale; (2) "motivation to conserve" scale; and (3) "energy conserver" scale. Each of these scales was measured by self-ratings on several different items.

Average self-ratings on the items in the energy conservation scales for the three Setback Thermostat interest segments are shown in Table 7.3. F-values from analyses of variance for the self-rated energy conservation items are also reported.

The highlights of the results in Table 7.3 include:

- The positive interest segment tended to agree more with the conservation ethic items.
- The positive interest segment were more likely to feel they could gain by conserving energy more.
- More than the other segments, the positive interest segment claimed to already set back their thermostats.

TABLE 7.3

INTEREST GROUPS FOR SETBACK THERMOSTATS SELF-RATING ON ENERGY CONSERVATION SCALE

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	211	63	128	
Conservation Ethic Scale[1]				
"By conserving energy in the home I feel I am a better citizen."	3.52	3.59	3.78	3.68**
"I pay attention to energy efficiency ratings when shopping for appliances."	3.27	3.26	3.46	1.68
"By conserving energy at home I also help prevent pollution."	3.56	3.61	3.65	0.45
"Conserving energy will save me money in the long run".	4.12	4.03	4.32	5.88**
Motivation to Conserve Scale[1]				
"It would be hard for me to cut down on the use of energy in my home."	3.31	3.50	3.64	5.46**
"There is not much the average citizen can do to save energy."	3.81	3.79	4.03	3.14**
"If I knew what to do I could save quite a bit of energy bills."	3.25	3.19	3.54	5.32**
Energy Conserver Scale[1]				
"I try to drive less now than in the past."	3.08	3.08	3.16	0.19
"I keep my thermostat lower than I did in past years."	3.35	3.40	3.55	1.50
"I turn lights off in my house whenever possible."	3.94	4.18	4.07	2.96*
"In the winter I turn my thermostat down at night."	3.48	3.43	3.79	3.70**

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

7.4 Life Style Scales

Respondents were asked to rate themselves on a number of general life style scales. Each of these scales was measured by self-ratings on several different items. Average self-ratings for the three product interest segments for the Setback Thermostat are shown in Table 7.4. F-values from analyses of variance for the self-rated items are also reported.

The life style correlates with interest in the Setback Thermostat generally formed a consistent image. The major correlates were:

- The positive interest segment expressed stronger self-confidence.
- They were more likely to view themselves as opinion leaders.
- The positive interest segment liked to be innovative with new brands or products.

TABLE 7.4

INTEREST GROUPS FOR SETBACK THERMOSTATS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Valu
Number of Respondents	211	63	128	
Price Conscious Scale[1]				
"I shop a lot for 'specials'."	3.56	3.56	3.67	0.56
"I find myself checking prices in the store for even small items."	3.83	3.84	3.89	0.17
"I usually watch the advertisements for announcements of sales."	3.69	3.68	3.78	0.43
"A person can save a lot of money by shopping around for bargains."	3.85	3.89	3.74	0.89
Homebody Scale[1]				
"I would rather spend a quiet evening at home than go out to a party."	3.28	3.26	3.25	0.04
"I like parties where there is lots of music and talk." (reverse scored)	3.01	2.95	2.83	1.10
"I am a homebody."	3.39	3.24	3.10	3.12*
Community Minded Scale[1]				
"I am an active member of more than one service organization."	2.62	2.71	2.77	0.85
"I do volunteer work for a hospital or service organization on a fairly regular basis."	2.63	2.47	2.75	1.39
"I like to work on community projects."	3.03	3.21	3.30	3.37*

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$

TABLE 7.4 (Continued)

INTEREST GROUPS FOR SETBACK THERMOSTATS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Valu
Number of Respondents	211	63	128	
Credit User Scale[1]				
"I buy many things with a credit card or a charge card."	2.73	2.71	2.66	0.16
"I like to pay cash for everything I buy." (reverse scored)	2.48	2.37	2.45	0.29
"It is good to have charge accounts."	3.08	3.00	2.95	0.59
"To buy anything, other than a house or a car, on credit is unwise." (reverse scored)	2.81	2.74	2.75	0.16
Self-Confident Scale[1]				
"I think I have more self-confidence than most people."	3.18	3.19	3.37	2.11
"I am more independent than most people."	3.49	3.37	3.67	2.84*
"I think I have a lot of personal ability."	3.62	3.53	3.76	2.62*
"I like to be considered a leader."	2.88	3.06	3.19	4.58*
Opinion Leader Scale[1]				
"My friends or neighbours often come to me for advice."	2.94	2.92	3.18	3.02*
"I sometimes influence what my friends buy."	3.11	3.03	3.27	1.57
"People come to me more often than I go to them about products."	2.95	3.00	3.17	2.99*

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 7.4 (Continued)

INTEREST GROUPS FOR SETBACK THERMOSTATS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	211	63	128	
Information Seeker Scale[1]				
"I often seek out the advice of my friends regarding which product to buy."	2.98	2.98	2.98	0.00
"I spend a lot of time talking with my friends about products and brands."	2.66	2.82	3.00	5.04**
"My neighbors or friends ussually give me good advice on which products to buy."	2.95	3.11	3.04	0.98
New Brand Trier Scale[1]				
"I often try new products before my friends and neighbours do."	2.81	2.92	3.20	7.51**
"I like to try new and different things."	3.46	3.40	3.73	4.67**
Financially Satisfied Scale[1]				
"Our family income is high enough to satisfy nearly all of our important desires."	3.66	3.37	3.82	5.35**
"No matter how fast our income goes up, we never seem to get ahead." (reverse scored)	3.04	2.87	2.90	0.92
"I wish we had a lot more money." (reverse scored)	2.52	2.39	2.32	1.58
Financial Optimist Scale[1]				
"I will probably have more money to spend next year than I have now."	2.93	2.85	3.14	2.28
"Five years from now our family income will probably be a lot higher than it is now."	3.30	3.35	3.51	1.70

---

1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$

TABLE 7.4 (Continued)

INTEREST GROUPS FOR SETBACK THERMOSTATS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	211	63	128	
Gadgeter Scale[1]				
"I think mechanical gadgets are fun."	3.09	3.10	3.24	0.82
"I enjoy buying mechanical gadgets."	2.74	2.68	2.90	1.45
Concern for Reliability Scale[1]				
"I won't buy a major appliance unless it has a good warranty."	3.90	4.10	4.01	2.02
"I think energy conserving devices are dependable."	3.23	3.23	3.40	2.24
Trust in System Scale[1]				
"Most big companies are only out to make a profit." (reverse scored)	2.39	2.53	2.35	0.78
"In my opinion we are facing energy shortages now."	3.31	3.36	3.44	0.60
"It is against the law to make false claims in advertising."	4.07	4.34	4.27	5.12**

---

1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$

7.5 Demographics and Household Characteristics

Respondents were asked to complete a questionnaire in which they provided basic demographic data as well as fairly detailed data on the characteristics of their household. These data are summarized in Table 7.5 with those respondents indicating no interest, ambivalence, or positive interest towards the Setback Thermostat Device reported as three separate groups.

The following observations may be made about the data provided in Table 7.5:

- There is a slight tendency for respondents in larger homes to indicate a positive interest in Thermostat Setback Devices.
- Respondents with electric heat and electric hot water heaters were more likely to show a positive interest in the device.
- Respondents with larger families were more likely to view the device favourably than were respondents with smaller families.
- There was a slight tendency for older respondents to indicate a no interest in the device.
- Neither sex nor education of respondents had any impact on interest in Thermostat Setback Devices.
- There was a slight tendency for upper income groups to indicate a positive interest in the device and a slight tendency for lower income groups to indicate no interest in the device.

TABLE 7.5

SETBACK THERMOSTAT DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	211		63		128
	%		%		%
Ownership of House:					
Own the house	96.6	——**——	90.3	——**——	96.1
Rent the house	3.4	——**——	9.7	——**——	3.9
Number of Rooms in the House:					
Three or less	3.0		3.2		2.4
4-5 rooms	38.9		39.7		36.0
6-7 rooms	39.4		39.7		38.4
8-9 rooms	15.8		11.1		16.8
10 or more	3.0		6.3		6.4
	└————————		**		————————┘
Number of Floors in the House:					
One floor	57.8		58.1		52.0
1 1/2 floors	12.1		8.1		9.4
2 floors	24.8		30.6		27.6
3 or more	5.3		3.2	——**——	11.0
	└————————		**		————————┘
Direction House Faces:					
North	31.5		34.9	——**——	23.2
	└————————		**		————————┘
South	31.5		34.9		30.4
East	19.7		20.6		26.4
	└————————		**		————————┘
West	17.2	——**——	9.5	——**——	20.0

---

1. Perçentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$

TABLE 7.5 (continued)

SETBACK THERMOSTAT DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	211	63	128
	%	%	%
Type of Heating Fuel:			
Natural gas	89.3	90.5	87.3
Heating oil	5.8	4.8	4.0
Electric	3.0	4.8	7.2
	└────────	**	────────┘
Other	2.0	0.0	1.6
Type of Hot Water Heater:			
Natural gas	81.5	79.0	72.2
	└────────	**	────────┘
Electric	18.5	21.0	27.8
	└────────	**	────────┘
Number of Vehicles in Household:			
None	4.9	4.9 ——*——	0.8
	└────────	**	────────┘
1 Vehicle	48.8	44.3	49.6
2 Vehicles	39.0	42.6	40.2
3 or more	7.3	8.2	9.4

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 7.5 (continued)

SETBACK THERMOSTAT DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	211		63		128
	%		%		%
Annual Heating Bill:					
Under $200	3.9	—*—	0.0		1.9
$201 - 300	7.2		7.5		6.7
$301 - 400	18.2	—*—	11.3	—**—	19.2
$401 - 500	30.9		37.7	—**—	25.0
	└		*		┘
$501 - 600	14.9		18.9		18.3
$601 - 700	12.2		13.2		15.4
$701 - 800	5.5		3.8		5.8
$801 - 900	3.9		5.7		4.8
Over $900	3.3		1.9		2.9
Annual Electric Bill:					
Under $100	2.2		3.8		1.9
$101 - 200	20.6		20.8	—**—	11.5
	└		**		┘
$201 - 300	32.2	—*—	41.5	—**—	29.8
$301 - 400	25.6	—**—	17.0	—**—	36.5
	└		**		┘
$401 - 500	11.1		11.3		10.6
Over $500	8.4		5.7	—*—	9.6

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 7.5 (continued)

SETBACK THERMOSTAT DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	211		63		128
	%		%		%
Household Vehicle Gasoline Bill:					
Under $100	3.7		2.1		1.0
$101 - 200	4.3		2.1		4.8
$201 - 300	9.8		8.3		4.8
	└		**		┘
$301 - 400	7.4		6.3		11.4
$401 - 500	9.2		10.4		9.5
$501 - 600	8.6		10.4		12.4
$601 - 700	8.6	---**---	14.6	---**---	4.8
$701 - 800	9.2	---**---	4.2		4.8
	└		*		┘
$801 - 900	6.1	---**---	12.5	---**---	4.8
$901 - 1000	8.0		6.3	---**---	13.3
	└		**		┘
Over $1000	25.2		22.9		28.6
Confidence in Estimate of Fuel Bill:					
Very confident	37.7		30.9	---**---	43.4
Somewhat confident	50.8		52.7	---*---	43.4
	└		*		┘
Not very confident	9.8		9.1		10.4
Not confident at all	1.6	---**---	7.3	---*---	2.8
Does Respondent Pay Household Bills:[2]					
Respondent pays bills	60.2		60.3		54.7
Other person pays bills	46.9		41.6		49.3

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

2. Percentages add to more than 100% because many households have more than one person who pays the bills.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 7.5 (continued)

SETBACK THERMOSTAT DEVICE INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest					
	No Interest		Ambivalent Interest		Positive Interest	
Number of Respondents[1]	211		63		128	
	%		%		%	
Number of People in Household:						
One person	4.5	**	0.0		0.8	**
Two	27.7		23.8		21.4	*
Three	21.8	**	31.7	*	22.2	
Four or Five	40.6		38.1	**	51.6	**
Six or more	5.4		6.3		4.0	
Number of Children Under 18 in Household:						
None	46.2		40.3		37.2	**
One	16.8	**	27.4	**	18.2	
Two	25.4	*	17.7	**	30.6	
Three or four	11.2		12.9		13.2	
Five or more	0.5		1.6		0.8	

---

[1] Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 7.5 (continued)

SETBACK THERMOSTAT DEVICE INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	211	63	128
	%	%	%
Age:			
18-24	4.1	6.3	5.8
25-34	26.5	22.2	29.8
35-44	22.4	28.6	29.8
	└───────────	**	───────────┘
45-54	19.4	17.5	14.9
55-64	14.3	19.0 ——*——	12.4
65 and over	13.3 ——**——	6.3	7.4
	└───────────	**	───────────┘
Sex:			
Male	46.7	51.6	47.5
Female	53.3	48.4	52.5
Education:			
Ten years or less	18.6	19.3	15.1
11-13 years	32.2	38.7	32.8
Vocational	19.6	16.1 ——*——	24.4
Some University	10.1	9.7	11.8
University graduate	19.6	16.1	16.0

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 7.5 (continued)

SETBACK THERMOSTAT DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	211	63	128
	%	%	%
Employment:			
Employed	54.1	60.3	51.7
Unemployed	4.6	6.3	9.2
	└────────	**	────────┘
Retired	14.3 ——**——	6.3	10.0
	└────────	*	────────┘
Housewife	25.5	27.0	28.3
Student	0.0	0.0	0.8
Other	1.5	0.0	0.0
Household Income:			
under $5000	1.7	0.0	0.9
$5,000 - 9,999	9.4 ——**——	3.8	0.9
	└────────	**	────────┘
$10,000 - 14,999	5.0 ——**——	11.3 ——**——	4.7
$15,000 - 19,999	10.0	13.2	7.5
$20,000 - 24,999	16.1	18.9	18.7
$25,000 - 29,999	20.0	20.8	18.7
$30,000 - 34,999	16.1	11.3 ——**——	19.6
$35,000 - 39,999	7.8	5.7	5.6
$40,000 - 44,999	2.8 ——**——	7.5	5.6
$45,000 - 49,999	5.0 ——**——	0.0	6.5
Over $50,000	6.1	7.5	11.2
	└────────	**	────────┘

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at α < .05
* Statistically significant at α < .10

7.6 Conclusions

The product interest segments for the Setback Thermostats were analyzed in the previous sections using several types of information: open-ended comments; ratings of diffusion factor attributes; self-ratings on energy conservation scales; self-ratings on life style scales; household characteristics; and personal demographics. The following discussion is based on the authors' interpretations of these results.

The three product interest segments for the Setback Thermostat were quite different. The no interest segment tended to dislike the basic function of the device. Those respondents who already set their thermostats back said that the device wouldn't save them anything. Those respondents who did not set back their thermostats manually usually claimed to not want to set them back.

The ambivalent interest segment tended to express concerns which suggested a lack of full understanding about the device. They tended to rate Setback Thermostats poorly on the simplicity, communicability, and trialability diffusion factor attributes.

In contrast, the positive interest segment seemed to like everything about the devices. In particular they liked its automatic character. Some respondents in the positive interest segment liked the automatic feature because they tended to forget to do it manually. Others liked the automatic feature because it would allow them to set the temperature back up before they awoke in the morning and before they returned home from work.

The Setback Thermostat is likely to diffuse reasonably well. There was a relatively large segment (32% in this study) who are interested in the device. The characteristics of these individuals are consistent with successful diffusion. The positive interest segment claimed to be self-confident, to be innovative about trying new products, and to exercise opinion leadership. Additionally these respondents expressed concern about conservation generally and felt they had something to gain by reducing their energy consumption.

Unfortunately, the successful diffusion of Setback Thermostats is not likely to have a significant impact in reducing our country's energy consumption. This is because most of the individuals who are interested in the device claim to already set their thermostats back manually. The incremental conservation produced by more consistent (no forgetting, etc.) setting back of the thermostat may be offset by the increased energy consumed by individuals who use the device to raise the house temperature earlier in the morning (before they arose) and earlier in the day (before returning from work).

8.0 IN-DEPTH ANALYSIS OF FURNACE FLUE DAMPER INTEREST SEGMENTS

A Furnace Flue Damper is a valve that prevents hot air from escaping through the chimney. It automatically closes the flue of the furnace when the furnace is off, thereby preventing heat loss. As stated on the information sheets provided to the respondents, the manufacturers of these devices claim: (1) savings of 15% of the annual heating bill; (2) a cost of $250 to $449 (depending on the specific flue damper); and (3) installation that must be done by a trained expert because improper installation could be dangerous.

8.1 Open-Ended Comments

Comments volunteered by respondents during open-ended discussion were classified into eight categories (savings comments, price comments, installation comments, product performance comments, life style comments, simplicity comments, "need to know more" comments, and believability comments). Each comment was also classified as to whether the comment was negative or positive. (See Appendix A for a selection of representative comments.)

Table 8.1 summarizes the types of comments the three Furnace Flue Damper interest segments volunteered about the device.

- All three product interest segments tended to mention favorably the savings with the Furnace Flue Damper.
- There were differences in the level of savings comments, however. The positive interest segment and the ambivalent interest segment both had very high percent mentions (85.7% and 70.9% respectively). In contrast only 43.2% of the no interest segment spoke positively about the savings. In addition, 21.6% of the no interest segment doubted the claimed savings.
- The quality of the savings comments also varied. Positive

savings comments volunteered by the no interest segment and the ambivalent interest segment tended to be mentioned without any particular enthusiasm (example: "it saves"). In contrast, the positive interest segment tended to speak of the savings in more personal terms ("I like the savings").

- The negative saving comments were also interesting. Two forms of negative comments occurred fairly frequently: (1) people who stated their home was already energy efficient and that therefore there was little to be gained by adding a Furnace Flue Damper and (2) people who felt there were better ways to invest in energy savings (e.g. increase insulation).
- There were many negative comments about the high cost of the Furnace Flue Damper. Though the positive interest segment tended to complain about the price less, this negative comment showed up in all three segments.
- There were some favorable price comments among the positive interest segment. These people tended not to particularly like the price but thought the price was reasonable.
- The no interest segment (and to a lesser extent the ambivalent interest segment) expressed concern for potential hazards from the device.

TABLE 8.1

OPEN-ENDED COMMENTS ABOUT FURNACE FLUE DAMPERS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents	185		182		35
	%		%		%
Savings Comments:					
Negative Mention	21.6	——**——	3.8		0.0
	└		——**——		┘
No Mention	35.1	——**——	25.3	——**——	14.3
	└		——**——		┘
Positive Mention	43.2	——**——	70.9	——**——	85.7
	└		——**——		┘
Price Comments:					
Negative Mention	51.9	——**——	40.1	——**——	22.9
	└		——**——		┘
No Mention	47.0	——**——	58.8		60.0
	└		——**——		┘
Positive Mention	1.1		1.1	——**——	17.1
	└		——**——		┘
Installation Comments:					
Negative Mention	10.8		9.3		5.7
No Mention	88.1		90.1		88.6
Positive Mention	1.1		0.5	——*——	5.7
	└		——*——		┘
Product Performance Comments:					
Negative Mention	36.8	——**——	12.6	——**——	0.0
	└		——**——		┘
No Mention	61.6	——**——	80.8	——**——	91.4
	└		——**——		┘
Positive Mention	1.6	——**——	6.6		8.6
	└		——**——		┘

**Statistically significant at α < .05
* Statistically significant at α < .10

TABLE 8.1 (continued)

OPEN-ENDED COMMENTS ABOUT FURNACE FLUE DAMPERS

	Percent Mention By Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents	185	182	35
	%	%	%
Life Style Comments:			
Negative Mention	1.6	1.6	0.0
No Mention	98.4	97.8	100.0
Positive Mention	0.0	0.5	0.0
Simplicity Comments:			
Negative Mention	4.3	4.9	2.9
No Mention	93.0	93.4	94.3
Positive Mention	2.7	1.6	2.9
Need More Information Comments:			
Negative Mention	7.6 ----**----	13.2 ----*-----	5.7
No Mention	92.4 ----**----	86.8 ----*-----	94.3
Positive Mention	0.0	0.0	0.0
Believability Comments:			
Negative Mention	10.8 ----**----	17.6	14.3
No Mention	89.2 ----**----	82.4	85.7
Positive Mention	0.0	0.0	0.0

**Statistically significant at α < .05
* Statistically significant at α < .10

8.2 Diffusion Factors

Respondents were asked to rate the Furnace Flue Damper on a number of product attributes which relate to various new product diffusion factors (relative advantage, life style compatibility, simplicity, communicability, and trialability). For each attribute separately, the average ratings by the product interest segments were computed. The extent of the differences among the three interest segments was tested using analysis of variance. The F-statistic, along with the three average ratings, is reported for each attribute in Table 8.2. The larger the F-value, the more distinctly different the three interest segments are on the attribute.

The major findings concerning the attribute ratings for the Furnace Flue Damper are as follows:

- While the differences among the interest segments tended to be statistically significant, the differences were mostly fairly small in magnitude.
- The no interest segment tended to respond unfavorably. The ambivalent interest segment responded neutrally, and the positive interest segment rated the attributes positively.

TABLE 8.2

PERCEPTIONS OF FURNACE FLUE DAMPERS RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	185	182	35	
Relative Advantage Attributes[1]				
"This device would soon pay for itself."	2.61	3.06	3.24	14.52**
"I doubt this device could save the amount of energy claimed." (reverse scored)	2.73	3.08	3.09	7.79**
"It would be hard to determine how much energy this device saves." (reverse scored)	2.70	2.77	2.97	1.28
"This device appears to be priced reasonably, given the claimed savings."	2.47	2.76	3.15	9.65**
"This device costs too much for the amount of energy it can save." (reverse scored)	2.49	2.80	3.15	10.38**
"The price of this device is too high for me to consider purchasing it." (reverse scored)	2.27	2.49	3.03	9.69**
"This device seems easy to install."	2.54	2.66	2.59	0.53
"This device should fit easily with my (car, furnace, shower, water heater)."	3.38	3.46	3.74	2.44*

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 8.2 (continued)

PERCEPTIONS OF FURNACE FLUE DAMPERS
RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	185	182	35	
Life Style Compatibility Attributes[1]				
"The use of this device might upset our daily household routine." (reverse scored)	3.81	3.95	4.03	2.34*
"Using this device would be inconvenient for my family." (reverse scored)	3.67	3.89	3.82	3.39**
Simplicity Attributes[1]				
"I understand how this device is supposed to work."	3.56	3.55	3.91	2.55*
"This device appears to be complicated." (reverse scored)	3.44	3.38	3.88	4.34**
Communicability Attributes[1]				
"It would be difficult to explain the operation of this device to my friends." (reverse scored)	3.20	3.27	3.50	1.24
"My friends would be interested in knowing about this device."	3.18	3.40	3.79	9.85**
Trialability Attributes[1]				
"The inability to try this device prior to purchase would make me hesitant to buy it." (reverse scored)	2.76	2.75	3.06	1.44
"I find it difficult to judge how useful this device would be because I cannot try it out in advance." (reverse scored)	2.63	2.72	2.85	0.90

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

8.3 Energy Conservation Scales

Respondents were asked to rate themselves on three energy conservation scales: (1) "conservation ethic" scale; (2) "motivation to conserve" scale; and (3) "energy conserver" scale. Each of these scales was measured by self-ratings on several different items.

Average self-ratings on the items in the energy conservation scales for the three Furnace Flue Damper interest segments are shown in Table 8.3. F-values from analyses of variance for the self-rated energy conservation items are also reported.

In general the results tend to show the three interest segments as virtually the same on all the conservation attitude and behavior items. The one exception was the positive interest segment was less likely to claim to "drive less now than in the past."

TABLE 8.3

INTEREST GROUPS FOR FURNACE FLUE DAMPERS SELF-RATING ON ENERGY CONSERVATION SCALE

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	185	182	35	
Conservation Ethic Scale[1]				
"By conserving energy in the home I feel I am a better citizen."	3.57	3.63	3.71	0.48
"I pay attention to energy efficiency ratings when shopping for appliances."	3.31	3.39	3.09	1.51
"By conserving energy at home I also help prevent pollution."	3.61	3.61	3.46	0.58
"Conserving energy will save me money in the long run".	4.20	4.13	4.23	0.74
Motivation to Conserve Scale[1]				
"It would be hard for me to cut down on the use of energy in my home."	3.48	3.41	3.43	0.24
"There is not much the average citizen can do to save energy."	3.85	3.86	4.09	1.20
"If I knew what to do I could save quite a bit of energy bills."	3.31	3.37	3.23	0.46
Energy Conserver Scale[1]				
"I try to drive less now than in the past."	3.10	3.19	2.74	2.63*
"I keep my thermostat lower than I did in past years."	3.50	3.38	3.23	1.23
"I turn lights off in my house whenever possible."	4.03	4.04	3.83	1.22
"In the winter I turn my thermostat down at night."	3.58	3.57	3.49	0.12

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

* Statistically significant at $\alpha < .10$

8.4 Life Style Scales

Respondents were asked to rate themselves on a number of general life style scales. Each of these scales was measured by self-ratings on several different items. Average self-ratings for the three product interest segments for the Furnace Flue Damper are shown in Table 8.4. F-values from analyses of variance for the self-rated items are also reported.

There were no particularly interesting life style correlates to Furnace Flue Damper interest segments.

TABLE 8.4

INTEREST GROUPS FOR FURNACE FLUE DAMPERS SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	185	182	35	
Price Conscious Scale[1]				
"I shop a lot for 'specials'."	3.57	3.62	3.60	0.08
"I find myself checking prices in the store for even small items."	3.85	3.89	3.63	1.25
"I usually watch the advertisements for announcements of sales."	3.68	3.74	3.83	0.47
"A person can save a lot of money by shopping around for bargains."	3.78	3.85	3.89	0.37
Homebody Scale[1]				
"I would rather spend a quiet evening at home than go out to a party."	3.19	3.37	3.17	1.86
"I like parties where there is lots of music and talk." (reverse scored)	2.90	2.99	2.94	0.40
"I am a homebody."	3.22	3.34	3.14	0.91
Community Minded Scale[1]				
"I am an active member of more than one service organization."	2.68	2.72	2.46	1.02
"I do volunteer work for a hospital or service organization on a fairly regular basis."	2.65	2.59	2.91	1.32
"I like to work on community projects."	3.16	3.13	3.14	0.05

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

TABLE 8.4 (Continued)

INTEREST GROUPS FOR FURNACE FLUE DAMPERS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Val
Number of Respondents	185	182	35	
Credit User Scale[1]				
"I buy many things with a credit card or a charge card."	2.71	2.70	2.69	0.01
"I like to pay cash for everything I buy." (reverse scored)	2.42	2.48	2.46	0.14
"It is good to have charge accounts."	3.17	2.93	2.83	2.90*
"To buy anything, other than a house or a car, on credit is unwise." (reverse scored)	2.78	2.84	2.51	1.13
Self-Confident Scale[1]				
"I think I have more self-confidence than most people."	3.33	3.18	3.09	2.21
"I am more independent than most people."	3.55	3.51	3.54	0.14
"I think I have a lot of personal ability."	3.64	3.67	3.58	0.37
"I like to be considered a leader."	3.09	2.94	2.97	1.36
Opinion Leader Scale[1]				
"My friends or neighbours often come to me for advice."	3.05	3.02	2.80	1.08
"I sometimes influence what my friends buy."	3.20	3.11	3.09	0.50
"People come to me more often than I go to them about products."	3.11	2.99	2.77	2.78*

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

* Statistically significant at $\alpha < .10$

TABLE 8.4 (Continued)

INTEREST GROUPS FOR FURNACE FLUE DAMPERS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	185	182	35	
Information Seeker Scale[1]				
"I often seek out the advice of my friends regarding which product to buy."	2.94	3.07	2.71	2.18
"I spend a lot of time talking with my friends about products and brands."	2.77	2.83	2.74	0.26
"My neighbors or friends ussually give me good advice on which products to buy."	3.02	3.02	2.80	0.97
New Brand Trier Scale[1]				
"I often try new products before my friends and neighbours do."	2.94	2.93	3.14	0.85
"I like to try new and different things."	3.57	3.51	3.49	0.31
Financially Satisfied Scale[1]				
"Our family income is high enough to satisfy nearly all of our important desires."	3.63	3.70	3.66	0.26
"No matter how fast our income goes up, we never seem to get ahead." (reverse scored)	3.01	2.92	3.00	0.32
"I wish we had a lot more money." (reverse scored)	2.46	2.38	2.60	0.80
Financial Optimist Scale[1]				
"I will probably have more money to spend next year than I have now."	3.07	2.94	2.77	1.56
"Five years from now our family income will probably be a lot higher than it is now."	3.35	3.40	3.40	0.12

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

TABLE 8.4 (Continued)

INTEREST GROUPS FOR FURNACE FLUE DAMPERS
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	185	182	35	
Gadgeter Scale[1]				
"I think mechanical gadgets are fun."	3.22	3.05	3.17	1.32
"I enjoy buying mechanical gadgets."	2.82	2.75	2.77	0.19
Concern for Reliability Scale[1]				
"I won't buy a major appliance unless it has a good warranty."	3.97	3.97	3.91	0.09
"I think energy conserving devices are dependable."	3.17	3.39	3.26	4.14**
Trust in System Scale[1]				
"Most big companies are only out to make a profit." (reverse scored)	2.24	2.48	2.77	5.73**
"In my opinion we are facing energy shortages now."	3.40	3.33	3.29	0.33
"It is against the law to make false claims in advertising."	4.23	4.18	3.91	2.92*

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1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

8.5 Demographics and Household Characteristics

Respondents were asked to complete a questionnaire in which they provided basic demographic data as well as fairly detailed data on the characteristics of their household. These data are summarized in Table 8.5 with those respondents indicating no interest, ambivalence, or positive interest towards the Furnace Flue Damper reported as three separate groups.

The information provided in Table 8.5 permits the following observations:

- Very few people (35 of 402) indicated a positive interest in the Furnace Flue Damper.
- People living in houses with only one floor were far more likely to speak negatively about the product than were people living in houses with more than one floor. The number of rooms in the house did not affect the respondents' interest in the device.
- In general, people with larger annual expenditures on energy of all types were more likely to indicate a positive interest in the Furnace Flue Damper.
- Family size had very little impact on the degree of respondent interest in the device.
- The 35-54 year old age groups were far more likely to be negatively disposed towards the device whereas both the younger and older categories indicated a positive interest in Furnace Flue Dampers.
- Females were far more likely to view the device positively than were males.
- University graduates tended to indicate a positive interest in the device.
- People in the higher income categories were more likely to react positively to Furnace Flue Dampers.

TABLE 8.5

FURNACE FLUE DAMPER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	185		182		35
	%		%		%
Ownership of House:					
Own the house	93.8	——**——	97.2		94.3
Rent the house	6.2	——**——	2.8		5.7
Number of Rooms in the House:					
Three or less	2.8		3.4		0.0
4-5 rooms	37.6		38.5		38.2
6-7 rooms	38.8		40.2		35.3
8-9 rooms	15.7		14.0		20.6
10 or more	5.1		3.9		5.9
Number of Floors in the House:					
One floor	60.0		55.8	——**——	35.3
	└—————		**		—————┘
1 1/2 floors	8.9		12.2		11.8
2 floors	23.9		27.6		35.3
	└—————		*		—————┘
3 or more	7.2	——*——	4.4	——**——	17.6
	└—————		**		—————┘
Direction House Faces:					
North	29.6		29.4		28.1
South	30.7		33.3		28.1
East	21.2		21.1	——*——	31.3
	└—————		*		—————┘
West	18.4		16.1		12.5

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 8.5 (continued)

FURNACE FLUE DAMPER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	185	182	35
	%	%	%
Type of Heating Fuel:			
Natural gas	90.0	87.2	91.4
Heating oil	2.8 ——**——	7.2	5.7
Electric	5.0	4.5	2.9
Other	2.3	1.1	0.0
Type of Hot Water Heater:			
Natural gas	79.3	76.7	79.4
Electric	20.7	23.3	20.6
Number of Vehicles in Household:			
None	3.4	3.4	5.7
1 Vehicle	50.8	49.2 ——**——	31.4
	└──────────	**	──────────┘
2 Vehicles	37.4	38.5 ——**——	60.0
	└──────────	**	──────────┘
3 or more	8.4	8.9 ——**——	2.9
	└──────────	**	──────────┘

---

[1] Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at α < .05
* Statistically significant at α < .10

TABLE 8.5 (continued)

FURNACE FLUE DAMPER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest					
	No Interest		Ambivalent Interest		Positive Interest	
Number of Respondents[1]	185		182		35	
	%		%		%	
Annual Heating Bill:						
Under $200	3.9		1.3		2.9	
$201 - 300	7.8		6.6		5.9	
$301 - 400	18.3		17.9		11.8	
$401 - 500	30.7		31.8	—**—	20.6	*
$501 - 600	16.3		17.9		11.8	
$601 - 700	10.5		13.9	—*—	23.5	**
$701 - 800	5.2		4.6		8.8	
$801 - 900	4.6		3.3	—**—	8.8	
Over $900	2.6		2.6		5.9	
Annual Electric Bill:						
Under $100	3.3		1.3		3.0	
$101 - 200	14.5	—**—	20.4		21.2	
$201 - 300	36.8		31.6	—*—	21.2	**
$301 - 400	31.6		27.0	—**—	12.1	**
$401 - 500	9.2		9.9	—**—	24.2	**
Over $500	4.7	—**—	9.9	—*—	18.1	**

---

1. Percentages computed based only on respondents who answered the question. This differed slighly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 8.5 (continued)

FURNACE FLUE DAMPER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	185	182	35
	%	%	%
Household Vehicle Gasoline Bill:			
Under $100	2.7	2.1	3.6
$101 - 200	4.1	4.2	3.6
$201 - 300	7.5	9.9 —**—	0.0
	└──	**	──┘
$301 - 400	10.3	7.0	7.1
$401 - 500	9.6	10.6	3.6
	└──	**	──┘
$501 - 600	8.2	10.6	17.9
	└──	**	──┘
$601 - 700	8.2	8.5	7.1
$701 - 800	5.5 —*—	8.5	7.1
$801 - 900	6.8	7.0	3.6
$901 - 1000	8.9	9.2	14.3
Over $1000	28.1 —*—	22.5 —*—	32.1
Confidence in Estimate of Fuel Bill:			
Very confident	39.2	39.9 —**—	27.3
	└──	**	──┘
Somewhat confident	51.0 —*—	44.9 —**—	57.6
Not very confident	9.2	11.4	6.1
Not confident at all	0.7 —**—	3.8 —*—	9.1
	└──	**	──┘
Does Respondent Pay Household Bills:[2]			
Respondent pays bills	60.0	58.8	48.6
	└──	*	──┘
Other person pays bills	43.8	48.9	51.4
	└──	*	──┘

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

2. Percentages add to more than 100% because many households have more than one person who pays the bills.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 8.5 (continued)

FURNACE FLUE DAMPER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	185	182	35
	%	%	%
Number of People in Household:			
One person	2.8	1.1 ——**——	8.6
	└————————	——**——	————————┘
Two	27.8	22.8	22.9
Three	23.3	25.0	17.1
Four or Five	42.6	44.4	45.7
Six or more	3.4 ——**——	6.7	5.7
Number of Children Under 18 in Household:			
None	43.8	39.8	48.6
One	20.1	18.8	14.3
Two	24.3	27.3	25.7
Three or four	11.2	13.1	11.4
Five or more	0.6	1.1	0.0

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$

TABLE 8.5 (continued)

FURNACE FLUE DAMPER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	185		182		35
	%		%		%
Age:					
18-24	3.5	——**——	6.9		2.9
25-34	25.1		25.9	——**——	40.0
	└——		——**——		——┘
35-44	27.5		25.9	——*——	17.1
	└——		——**——		——┘
45-54	20.5		17.8	——**——	2.9
	└——		——**——		——┘
55-64	13.5		13.8	——*——	22.9
	└——		——*——		——┘
65 and over	9.9		9.8		14.3
Sex:					
Male	51.5		46.6	——*——	35.3
	└——		——**——		——┘
Female	48.5		53.4	——*——	64.7
Education:					
Ten years or less	15.9		19.2		18.2
11-13 years	32.9		36.2	——*——	21.2
	└——		——**——		——┘
Vocational	21.2		19.2		24.2
Some University	12.9	——*——	9.0		6.1
	└——		——*——		——┘
University graduate	17.1		16.4	——**——	30.3
	└——		——**——		——┘

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 8.5 (continued)

FURNACE FLUE DAMPER INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	185		182		35
	%		%		%
Employment:					
Employed	54.5		55.1		50.0
Unemployed	9.6	——**——	3.9		2.9
Retired	9.6		12.4		17.6
	└------------		*		------------┘
Housewife	25.1		27.5		29.4
Student	0.0		0.6		0.0
Other	1.2		0.6		0.0
Household Income:					
under $5000	0.7		1.9		0.0
$5,000 - 9,999	7.4	——*——	4.4		6.1
$10,000 - 14,999	4.7		6.3		9.1
$15,000 - 19,999	11.4		9.5	——**——	3.0
$20,000 - 24,999	18.8		17.1		12.1
$25,000 - 29,999	18.1		22.8	——**——	12.1
$30,000 - 34,999	17.4		13.9	——**——	24.2
$35,000 - 39,999	5.4		8.2		6.1
$40,000 - 44,999	4.0		4.4		6.1
$45,000 - 49,999	2.7	——**——	7.0		3.0
Over $50,000	9.4	——**——	4.4	——**——	18.2
	└------------		*		------------┘

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

8.6 Conclusions

The product interest segments for the Furnace Flue Dampers were analyzed in the previous sections in detail using several types of information: open-ended comments; ratings of diffusion factor attributes; self-ratings on energy conservation scales; self-ratings on life style scales; household characteristics; and personal demographics. The following discussion is based on the authors' interpretations of these results.

Only 32 of the 402 respondents in this study expressed a positive interest in the Furnace Flue Dampers. This number was too small to form a reliable picture of the characteristics of a typical interested individual. It is more useful to look at why people were not interested in this device. The reasons for non-interest were as follows:

- There were potential hazards in the installation or use.
- The cost was simply too high to even consider.
- The home was already energy efficient and therefore the respondent didn't believe the device could save the amount claimed.
- The home was not already energy efficient but the respondent felt that the money could be better used in other ways (usually to increase insulation).

9.0 IN-DEPTH ANALYSIS OF FLUE HEAT RECOVERY DEVICE INTEREST SEGMENTS

A Flue Heat Recovery Device is a heat reclaimer which attaches to the base of the furnace flue and redirects warm air, which otherwise would have been wasted, back into the house. As stated on the information sheets provided to the respondents, the manufacturers of these devices claimed: (1) savings of 8% of the annual heating bill; (2) a cost of $140 including installation; and (3) installation that must be done by a trained expert.

9.1 Open-Ended Comments

Comments volunteered by respondents during open-ended discussion were classified into eight categories (savings comments, price comments, installation comments, product performance comments, life style comments, simplicity comments, "need to know more" comments, and believability comments). Each comment was also classified as to whether the comment was negative or positive. (See Appendix A for a selection of representative comments.)

Table 9.1 summarizes the types of comments the three Flue Heat Recovery Device interest segments volunteered about the device:

- The positive interest segment was very favorable about the claimed savings but this interest was uncertain. Many of the positive interest segment either said they weren't completely sure about the savings claim or felt they needed more information before forming a definite conclusion.
- The no interest segment was undecided about how favorable the savings claims were (38% made negative savings comments but 20% made positive savings comments).
- The no interest group was also concerned about the price and the safety aspects of the device.

TABLE 9.1

OPEN-ENDED COMMENTS ABOUT FLUE HEAT RECOVERY DEVICES

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents	155		191		56
	%		%		%
Savings Comments:					
Negative Mention	38.1	——**——	6.8	——**——	0.0
	└———	———	**	———	———┘
No Mention	41.9	——**——	30.4	——**——	16.1
	└———	———	**	———	———┘
Positive Mention	20.0	——**——	62.8	——**——	83.9
	└———	———	**	———	———┘
Price Comments:					
Negative Mention	27.1	——**——	17.3	——**——	7.1
	└———	———	**	———	———┘
No Mention	70.3	——**——	77.5	——**——	66.1
Positive Mention	2.6		5.2	——**——	26.8
	└———	———	**	———	———┘
Installation Comments:					
Negative Mention	8.4		6.8		8.9
No Mention	91.6		92.1	——*——	85.7
Positive Mention	0.0		1.0	——*——	5.4
	└———	———	**	———	———┘
Product Performance Comments:					
Negative Mention	19.4	——**——	6.3		1.8
	└———	———	**	———	———┘
No Mention	78.1	——**——	85.3		89.3
	└———	———	**	———	———┘
Positive Mention	2.6	——**——	8.4		8.9
	└———	———	**	———	———┘

**Statistically significant at $\alpha < .05$

* Statistically significant at $\alpha < .10$

TABLE 9.1 (continued)

OPEN-ENDED COMMENTS ABOUT FLUE HEAT RECOVERY DEVICES

	Percent Mention By Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents	155		191		56
	%		%		%
Life Style Comments:					
Negative Mention	1.3		2.1		0.0
No Mention	98.7		97.9		100.0
Positive Mention	0.0		0.0		0.0
Simplicity Comments:					
Negative Mention	5.2	----**----	15.7	----**----	5.4
No Mention	93.5	----**----	84.3	----**----	94.6
Positive Mention	1.3		0.0		0.0
Need More Information Comments:					
Negative Mention	6.5	----**----	23.0		23.2
	└----------	----------	----**----	----------	----------┘
No Mention	93.5	----**----	77.0		76.8
	└----------	----------	----**----	----------	----------┘
Positive Mention	0.0		0.0		0.0
Believability Comments:					
Negative Mention	20.0		17.3		21.4
No Mention	80.0		82.7	----**----	73.2
Positive Mention	0.0		0.0	----**----	5.4
	└----------	----------	----**----	----------	----------┘

**Statistically significant at $\alpha < .05$

9.2 Diffusion Factors

Respondents were asked to rate the Flue Heat Recovery Device on a number of product attributes which relate to various new product diffusion factors (relative advantage, life style compatibility, simplicity, communicability, and trialability). For each attribute separately, the average ratings by the product interest segments were computed. The extent of the differences among the three interest segments were tested using analysis of variance. The F-statistic, along with the three average ratings, is reported for each attribute in Table 9.2. The larger the F-value, the more distinctly different the three interest segments are on the attribute.

The major findings concerning the attribute ratings for the Flue Heat Recovery Device are as follows:

- The positive interest segment tended to view the relative advantage attributes much more favorably than did the other two segments.
- The positive interest segment also rated the communicability aspects higher.
- There were few interesting differences among the interest segments on the other diffusion factors (life style compatibility, simplicity, and trialability).

TABLE 9.2 (continued)

PERCEPTIONS OF FLUE HEAT RECOVERY DEVICES RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	155	191	56	
Life Style Compatibility Attributes[1]				
"The use of this device might upset our daily household routine." (reverse scored)	3.89	3.96	4.04	1.02
"Using this device would be inconvenient for my family." (reverse scored)	3.73	3.87	3.91	2.12
Simplicity Attributes[1]				
"I understand how this device is supposed to work."	3.42	3.31	3.64	2.64*
"This device appears to be complicated." (reverse scored)	3.40	3.41	3.58	0.96
Communicability Attributes[1]				
"It would be difficult to explain the operation of this device to my friends." (reverse scored)	3.02	3.06	3.39	3.03**
"My friends would be interested in knowing about this device."	3.03	3.30	3.56	10.74**
Trialability Attributes[1]				
"The inability to try this device prior to purchase would make me hesitant to buy it." (reverse scored)	2.77	2.72	2.93	1.00
"I find it difficult to judge how useful this device would be because I cannot try it out in advance." (reverse scored)	2.70	2.59	2.73	0.83

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

9.3 Energy Conservation Scales

Respondents were asked to rate themselves on three energy conservation scales: (1) "conservation ethic" scale; (2) "motivation to conserve" scale; and (3) "energy conserver" scale. Each of these scales was measured by self-ratings on several different items.

Average self-ratings on items in the energy conservation scales for the three Flue Heat Recovery Device interest segments are shown in Table 9.3. F-values from analyses of variance for the self-rated energy conservation items are also reported.

There was a mild tendency for the positive interest segment to rate their chances of saving money through energy conservation higher than did the other segments. Other than this observation, there were no other consistent or interesting differences among the interest segments in terms of the energy conservation scales.

TABLE 9.3

INTEREST GROUPS FOR FLUE HEAT RECOVERY DEVICES SELF-RATING ON ENERGY CONSERVATION SCALE

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	155	191	56	
Conservation Ethic Scale[1]				
"By conserving energy in the home I feel I am a better citizen."	3.50	3.69	3.67	2.08
"I pay attention to energy efficiency ratings when shopping for appliances."	3.23	3.40	3.35	1.31
"By conserving energy at home I also help prevent pollution."	3.50	3.65	3.66	1.62
"Conserving energy will save me money in the long run".	4.15	4.15	4.30	1.33
Motivation to Conserve Scale[1]				
"It would be hard for me to cut down on the use of energy in my home."	3.32	3.49	3.61	2.58*
"There is not much the average citizen can do to save energy."	3.88	3.82	4.06	1.61
"If I knew what to do I could save quite a bit of energy bills."	3.28	3.34	3.48	1.05
Energy Conserver Scale[1]				
"I try to drive less now than in the past."	3.11	3.11	3.09	0.03
"I keep my thermostat lower than I did in past years."	3.39	3.43	3.48	0.17
"I turn lights off in my house whenever possible."	3.96	4.05	4.06	0.72
"In the winter I turn my thermostat down at night."	3.54	3.59	3.59	0.09

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

* Statistically significant at $\alpha < .10$

9.4 Life Style Scales

Respondents were asked to rate themselves on a number of general life style scales. Each of these scales was measured by self-ratings on several different items. Average self-ratings for the three product interest segments for the Flue Heat Recovery Device are shown in Table 9.4. F-values from analyses of variance for the self-rated items are also reported.

There were few significant life style correlates with Flue Heat Recovery Device interest segments. One interesting finding involved the responses to the item "our family income is high enough to satisfy nearly all of our important desires." The positive interest segment rated themselves much higher on this item. This may be somewhat relevant given the moderately high price of the device.

TABLE 9.4

INTEREST GROUPS FOR FLUE HEAT RECOVERY DEVICES SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	155	191	56	
Price Conscious Scale[1]				
"I shop a lot for 'specials'."	3.66	3.54	3.61	0.70
"I find myself checking prices in the store for even small items."	3.85	3.83	3.89	0.12
"I usually watch the advertisements for announcements of sales."	3.78	3.66	3.74	0.66
"A person can save a lot of money by shopping around for bargains."	3.90	3.80	3.67	1.30
Homebody Scale[1]				
"I would rather spend a quiet evening at home than go out to a party."	3.22	3.28	3.36	0.41
"I like parties where there is lots of music and talk." (reverse scored)	2.91	2.98	2.93	0.18
"I am a homebody."	3.21	3.34	3.21	0.70
Community Minded Scale[1]				
"I am an active member of more than one service organization."	2.60	2.76	2.62	1.22
"I do volunteer work for a hospital or service organization on a fairly regular basis."	2.61	2.65	2.70	0.17
"I like to work on community projects."	3.19	3.13	3.07	0.33

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

TABLE 9.4 (Continued)

INTEREST GROUPS FOR FLUE HEAT RECOVERY DEVICES
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Val
Number of Respondents	155	191	56	
Credit User Scale[1]				
"I buy many things with a credit card or a charge card."	2.78	2.62	2.81	1.10
"I like to pay cash for everything I buy." (reverse scored)	2.43	2.44	2.56	0.30
"It is good to have charge accounts."	3.02	2.98	3.20	0.85
"To buy anything, other than a house or a car, on credit is unwise." (reverse scored)	2.89	2.63	2.98	3.04
Self-Confident Scale[1]				
"I think I have more self-confidence than most people."	3.30	3.17	3.30	1.14
"I am more independent than most people."	3.64	3.44	3.54	2.36
"I think I have a lot of personal ability."	3.70	3.61	3.62	0.77
"I like to be considered a leader."	3.05	2.94	3.15	1.36
Opinion Leader Scale[1]				
"My friends or neighbours often come to me for advice."	3.04	2.95	3.15	1.09
"I sometimes influence what my friends buy."	3.27	3.09	3.02	2.05
"People come to me more often than I go to them about products."	3.10	2.99	2.93	1.18

---

1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 9.4 (Continued)

INTEREST GROUPS FOR FLUE HEAT RECOVERY DEVICES
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	155	191	56	
Information Seeker Scale[1]				
"I often seek out the advice of my friends regarding which product to buy."	3.03	2.92	3.04	0.57
"I spend a lot of time talking with my friends about products and brands."	2.79	2.77	2.91	0.46
"My neighbors or friends ussually give me good advice on which products to buy."	3.01	2.96	3.13	0.78
New Brand Trier Scale[1]				
"I often try new products before my friends and neighbours do."	3.01	2.92	2.92	0.50
"I like to try new and different things."	3.53	3.51	3.61	0.27
Financially Satisfied Scale[1]				
"Our family income is high enough to satisfy nearly all of our important desires."	3.76	3.52	3.91	5.24**
"No matter how fast our income goes up, we never seem to get ahead." (reverse scored)	3.00	2.92	3.04	0.33
"I wish we had a lot more money." (reverse scored)	2.46	2.39	2.52	0.45
Financial Optimist Scale[1]				
"I will probably have more money to spend next year than I have now."	2.99	2.95	3.09	0.46
"Five years from now our family income will probably be a lot higher than it is now."	3.34	3.39	3.41	0.15

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[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$

TABLE 9.4 (Continued)

INTEREST GROUPS FOR FLUE HEAT RECOVERY DEVICES SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	155	191	56	
Gadgeter Scale[1]				
"I think mechanical gadgets are fun."	3.18	3.13	3.06	0.33
"I enjoy buying mechanical gadgets."	2.84	2.73	2.80	0.48
Concern for Reliability Scale[1]				
"I won't buy a major appliance unless it has a good warranty."	3.94	4.02	3.84	1.47
"I think energy conserving devices are dependable."	3.18	3.34	3.35	2.25
Trust in System Scale[1]				
"Most big companies are only out to make a profit." (reverse scored)	2.28	2.46	2.50	1.82
"In my opinion we are facing energy shortages now."	3.34	3.38	3.31	0.11
"It is against the law to make false claims in advertising."	4.16	4.21	4.09	0.63

---

1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

9.5 Demographics and Household Characteristics

Respondents were asked to complete a questionnaire in which they provided basic demographic data as well as fairly detailed data on the characteristics of their household. These data are summarized in Table 9.5 with those respondents indicating no interest, ambivalence, or positive interest towards the Flue Heat Recovery Device reported as three separate groups.

The following observations can be made about the data summarized on Table 9.5:

- Respondents with electric hot water heaters were more likely to indicate a positive interest in the device whereas respondents with natural gas hot water heaters were more likely to be negative in their comments about the Flue Heat Recovery device.
- Females were far more receptive to the device than were males.
- Unemployed individuals were typically found to express a higher percentage of positive comments than other groups.
- Middle income groups ($20,000 to $34,999) were more likely to indicate a positive interest in the Flue Heat Recovery device.

TABLE 9.5

FLUE HEAT RECOVERY DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	155	191	56
	%	%	%
Ownership of House:			
Own the house	95.4	94.6	98.1
Rent the house	4.6	5.4	1.9
Number of Rooms in the House:			
Three or less	2.0	3.2	3.7
4-5 rooms	44.4 ——**——	34.9	31.5
	└————	————**————	————┘
6-7 rooms	33.1 ——**——	41.4	48.1
	└————	————**————	————┘
8-9 rooms	15.9	16.1	11.1
10 or more	4.6	4.3	5.6
Number of Floors in the House:			
One floor	58.8	53.5	56.4
1 1/2 floors	10.5	9.6	14.5
2 floors	25.5	28.3	23.6
3 or more	5.2 ——**——	8.6	5.5
Direction House Faces:			
North	28.1	31.5	25.9
South	30.7	35.3 ——**——	22.2
	└————	————*————	————┘
East	25.5 ——**——	18.5	24.1
West	15.7	14.7 ——**——	27.8
	└————	————**————	————┘

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 9.5 (continued)

FLUE HEAT RECOVERY DEVICE INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	155	191	56
	%	%	%
Type of Heating Fuel:			
Natural gas	88.2	89.3	89.1
Heating oil	5.9	4.3	5.5
Electric	3.4	5.9	3.6
Other	2.7	0.5	1.8
Type of Hot Water Heater:			
Natural gas	79.7	79.0 ———*———	70.4
	└────	──**──	────┘
Electric	20.3	21.0 ——*——	29.6
	└────	──**──	────┘
Number of Vehicles in Household:			
None	2.6	4.8	1.9
1 Vehicle	49.7	49.5	40.7
	└────	──*──	────┘
2 Vehicles	41.2	38.2	42.6
3 or more	6.5	7.5 ——*——	14.8
	└────	──**──	────┘

---

[1] Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 9.5 (continued)

FLUE HEAT RECOVERY DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	155	191	56
	%	%	%
Annual Heating Bill:			
Under $200	2.2	3.8	0.0
$201 - 300	5.2	5.2 ——**——	18.8
	└————	————**————	————┘
$301 - 400	19.3	16.8	14.6
$401 - 500	32.6	29.0	27.1
$501 - 600	17.0	15.5	18.8
$601 - 700	12.6	13.5	14.6
$701 - 800	5.9	6.5 ——**——	0.0
	└————	————**————	————┘
$801 - 900	2.2 ——**——	5.8	6.3
	└————	————*————	————┘
Over $900	2.9	3.8	0.0
Annual Electric Bill:			
Under $100	2.9	2.0	2.1
$101 - 200	21.2 ——**——	14.4	19.1
$201 - 300	32.8	34.0	29.8
$301 - 400	27.7	28.1	25.5
$401 - 500	7.3 ——**——	13.7	12.8
	└————	————*————	————┘
Over $500	8.0	8.0	10.7

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 9.5 (continued)

FLUE HEAT RECOVERY DEVICE INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	155		191		56
	%		%		%
Household Vehicle Gasoline Bill:					
Under $100	3.1		2.8		0.0
$101 - 200	6.1	—**—	2.1		4.7
$201 - 300	9.2	—*—	6.3		9.3
$301 - 400	9.2		9.2		4.7
	└	————	*	————	┘
$401 - 500	9.2		10.6		7.0
$501 - 600	7.6	—**—	12.7		9.3
$601 - 700	5.3	—**—	9.2		14.0
	└	————	**	————	┘
$701 - 800	8.4	—**—	4.9		9.3
$801 - 900	9.2		6.3	—**—	0.0
	└	————	**	————	┘
$901 - 1000	6.9	—*—	9.9		16.3
	└	————	**	————	┘
Over $1000	26.0		26.1		25.6
Confidence in Estimate of Fuel Bill:					
Very confident	36.8		40.1		37.0
Somewhat confident	50.0		47.5		50.0
Not very confident	9.6		9.9		10.9
Not confident at all	3.7		2.5		2.2
Does Respondent Pay Household Bills:[2]					
Respondent pays bills	60.6		56.0		60.7
Other person pays bills	45.2		48.2		46.4

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

2. Percentages add to more than 100% because many households have more than one person who pays the bills.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 9.5 (continued)

FLUE HEAT RECOVERY DEVICE INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	155		191		56
	%		%		%
Number of People in Household:					
One person	2.6		3.2		0.0
Two	22.9		26.5		26.4
Three	21.6		24.9		24.5
Four or Five	47.1	---*---	40.0		47.2
Six or more	5.9		5.4		1.9
	└------------	------------	*	------------	------------┘
Number of Children Under 18 in Household:					
None	38.5	---*---	45.6		42.0
One	20.3		19.8	---**---	12.0
	└------------	------------	**	------------	------------┘
Two	25.0		23.1	---**---	38.0
	└------------	------------	**	------------	------------┘
Three or four	15.5	---*---	10.4		8.0
	└------------	------------	**	------------	------------┘
Five or more	0.7		1.1		0.0

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 9.5 (continued)

FLUE HEAT RECOVERY DEVICE INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	155		191		56
	%		%		%
Age:					
18-24	3.4		5.5		7.8
	└────	────	*	────	────┘
25-34	27.7		26.5		25.5
35-44	27.7		23.8		27.5
45-54	16.2		17.7		21.6
55-64	14.2		16.0		9.8
65 and over	10.8		10.5		7.8
Sex:					
Male	55.1	——**——	42.2		46.0
	└────	────	*	────	────┘
Female	44.9	——**——	57.8		54.0
	└────	────	*	────	────┘
Education:					
Ten years or less	19.0		17.2		15.4
11-13 years	33.3		31.5	——*——	40.4
Vocational	19.0		22.1		19.2
Some University	12.9	——*——	8.8		9.6
University graduate	15.6		20.4		15.4

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1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 9.5 (continued)

FLUE HEAT RECOVERY DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	155		191		56
	%		%		%
Employment:					
Employed	56.9		51.4		57.7
Unemployed	4.9		6.0	—*—	11.5
	└──		**		──┘
Retired	10.4		13.1		9.6
Housewife	27.1		27.9		21.2
Student	0.0		0.5		0.0
Other	0.7		1.1		0.0
Household Income:					
under $5000	2.2		0.6		0.0
$5,000 - 9,999	7.2		6.5	—**—	0.0
	└──		**		──┘
$10,0 - 14,999	7.2		5.2		4.2
$15,000 - 19,999	9.4		11.7	—**—	4.2
	└──		**		──┘
$20,000 - 24,999	13.8	—**—	20.8		16.7
$25,000 - 29,999	14.5	—**—	21.4		29.2
	└──		**		──┘
$30,000 - 34,999	18.1	—*—	13.0	—**—	22.9
$35,000 - 39,999	8.7		5.2		6.3
$40,000 - 44,999	5.8		3.9		2.1
$45,000 - 49,999	4.3		4.5		6.3
Over $50,000	8.7		7.1		8.3

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

9.6 Conclusions

The product interest segments for the Flue Heat Recovery Devices were analyzed in the previous sections in detail using several types of information: open-ended comments; ratings of diffusion factor attributes; self-ratings on energy conservation scales; self-ratings on life style scales; household characteristics; and personal demographics. The following discussion is based on the authors' interpretations of these results.

Only 56 out of the 402 respondents in this study indicated a positive interest in the Flue Heat Recovery Device. Furthermore the positive interest expressed by these respondents tended to be mild and uncertain. Interestingly enough, the much larger no interest segment also tended to be uncertain in their opinion. They weren't interested in the device but they weren't quite sure why they weren't interested.

Overall it seemed that most people (regardless of interest segment) viewed the Flue Heat Recovery Devices as capable of saving money but also costing moderately highly. The devices weren't perceived as having any strong drawbacks, but in some undefined way was not an interesting concept. More than for any other device tested, people seemed bored when discussing or rating this device. In consequence, the diffusion potential for this product is minimal.

10.0 IN-DEPTH ANALYSIS OF AUTO GAS SAVING DEVICE INTEREST SEGMENTS

Two versions of gas saving devices were presented to respondents as typical of the types of devices on the market:

- A capacitive discharge ignition system is an electronic ignition device, connected between the distributor and the coil, that stores and generates electrical energy to fire the spark plugs. It provides the same amount of electrical energy at all engine speeds; a conventional ignition system delivers less energy at high speeds. As stated on the information sheets provided to the respondents, the manufacturers of these devices claim: (1) savings through 10% more gasoline mileage; (2) cost of $30; and (3) do-it-yourself installation.
- A super energy cell is a fuel pressure regulator installed between the fuel pump and carburetor. The device limits the fuel pressure and prevents too much gasoline from being pumped into the carburetor at high speed. As stated on the information sheets, the manufacturers claim: (1) savings of up to 25% less gasoline consumption; (2) cost of $7; and (3) installation which requires cutting the fuel line.

10.1 Open-Ended Comments

Comments volunteered by respondents during open-ended discussion were classified into eight categories (savings comments, price comments, installation comments, product performance comments, life style comments, simplicity comments, "need to know more" comments, and believability comments.) Each comment was also classified as to whether the comment was negative or positive. (See Appendix A for a selection of representative comments.)

Table 10.1 summarizes the types of comments the three Auto Gas Saving Device interest segments volunteered about the device:

- The perceived potential for gas savings was discussed enthusiastically by almost all of the positive interest segment and even by most of the ambivalent interest segment. There was no consistent pattern of response to the savings idea among the no interest segment.
- The positive interest segment also tended to be mildly favorable about the ease of installation and the price.

- There was a fair proportion of the no interest segment that raised life style negative points. These comments mostly referred to individuals that did little high speed or long distance driving and who, therefore, felt that the devices would not be very useful.

- There were also some who were concerned about the impact of the device on general automobile engine performance.

- In a similar vein some people were worried about installation problems, particularly the cutting of the fuel line for the super energy cell.

- The area of greatest concern for the Auto Gas Saving Devices was in the area of the believability of the savings claims. All interest segments had some degree of concern.
  - The positive interest segment and the ambivalent interest segment tended to express doubt about the validity of the claims and wanted some form of documentary support.
  - The no interest segment was more negative. They often expressed conviction that the devices didn't work.

TABLE 10.1

OPEN-ENDED COMMENTS ABOUT AUTO GAS SAVING DEVICES

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents	146		130		126
	%		%		%
Savings Comments:					
Negative Mention	24.7	---**---	3.1	---*---	0.0
	└───────		**		───────┘
No Mention	58.9	---**---	20.0	---**---	4.8
	└───────		**		───────┘
Positive Mention	16.4	---**---	76.9	---**---	95.2
	└───────		**		───────┘
Price Comments:					
Negative Mention	2.1		2.3		0.0
No Mention	89.7	---**---	73.1	---**---	57.1
	└───────		**		───────┘
Positive Mention	8.2	---**---	24.6	---**---	42.9
	└───────		**		───────┘
Installation Comments:					
Negative Mention	5.5	---**---	13.1	---**---	4.8
No Mention	91.8	---**---	75.4		74.6
	└───────		**		───────┘
Positive Mention	2.7	---**---	11.5	---**---	20.6
	└───────		**		───────┘
Product Performance Comments:					
Negative Mention	14.4		11.5	---**---	5.6
	└───────		**		───────┘
No Mention	84.9		84.6	---*---	90.5
	└───────		*		───────┘
Positive Mention	0.7		3.8		4.0
	└───────		*		───────┘

**Statistically significant at .05
* Statistically significant at .10

TABLE 10.1 (continued)

OPEN-ENDED COMMENTS ABOUT AUTO GAS SAVING DEVICES

	Percent Mention By Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents	146		130		126
	%		%		%
Life Style Comments:					
Negative Mention	20.5	——**——	6.9	——**——	0.0
			**		
No Mention	79.5	——**——	91.5		91.3
			**		
Positive Mention	0.0		1.5	——**——	8.7
			**		
Simplicity Comments:					
Negative Mention	2.1	——**——	9.2		7.1
			**		
No Mention	97.9	——**——	90.8		92.9
			**		
Positive Mention	0.0		0.0		0.0
Need More Information Comments:					
Negative Mention	11.0	——**——	32.3	——**——	22.2
			**		
No Mention	89.0	——**——	67.7	——**——	77.0
			**		
Positive Mention	0.0		0.0		0.8
Believability Comments:					
Negative Mention	54.1	——**——	34.6	——**——	25.4
			**		
No Mention	45.9	——**——	65.4	——*——	73.0
			**		
Positive Mention	0.0		0.0		1.6

**Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

10.2 Diffusion Factors

Respondents were asked to rate the Auto Gas Saving Devices on a number of product attributes which relate to various new product diffusion factors (relative advantage, life style compatibility, simplicity, communicability and trialability). For each attribute separately, the average ratings by the product interest segments were computed. The extent of the differences among the three interest segments were tested using analysis of variance. The F-statistic, along with the three average ratings, is reported for each attribute in Table 10.2. The larger the F-value, the more distinctly different the three interest segments are on the attribute.

The main findings concerning the attribute ratings for the Auto Gas Saving Devices are as follows:

- The strongest area of distinction among the interest segments was in terms of their ratings of savings and their belief in those savings. The pattern of responses tended to show the positive interest segment as favorable toward the savings from the Auto Gas Saving Devices. The no interest segment tended to be negative or neutral. The ambivalent interest segment scored in between these two extremes.
- A similar pattern and magnitude of difference was shown for the attribute "My friends would be interested in knowing about this device."
- The positive interest segment tended to score statistically significantly more favorable to the Auto Gas Saving Device on almost all of the other attributes. However, these other distinctions are mostly fairly small in magnitude.

TABLE 10.2

PERCEPTIONS OF AUTO GAS SAVING DEVICES RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	146	130	126	
Relative Advantage Attributes[1]				
"This device would soon pay for itself."	3.21	3.70	3.97	27.99**
"I doubt this device could save the amount of energy claimed." (reverse scored)	2.46	2.95	3.29	28.35**
"It would be hard to determine how much energy this device saves." (reverse scored)	2.56	2.91	3.29	17.16**
"This device appears to be priced reasonably, given the claimed savings."	3.73	3.92	4.01	5.22**
"This device costs too much for the amount of energy it can save." (reverse scored)	3.49	3.93	4.06	19.71**
"The price of this device is too high for me to consider purchasing it." (reverse scored)	3.73	3.94	4.06	6.95**
"This device seems easy to install."	3.49	3.27	3.50	2.58*
"This device should fit easily with my (car, furnace, shower, water heater)."	3.60	3.57	3.75	2.04

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 10.2 (continued)

PERCEPTIONS OF AUTO GAS SAVING DEVICES
RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	146	130	126	
Life Style Compatibility Attributes[1]				
"The use of this device might upset our daily household routine." (reverse scored)	3.88	3.93	4.15	6.46**
"Using this device would be inconvenient for my family." (reverse scored)	3.86	3.85	4.06	3.94**
Simplicity Attributes[1]				
"I understand how this device is supposed to work."	3.19	3.08	3.37	2.69*
"This device appears to be complicated." (reverse scored)	3.44	3.43	3.65	2.76*
Communicability Attributes[1]				
"It would be difficult to explain the operation of this device to my friends." (reverse scored)	2.93	2.93	3.27	4.38**
"My friends would be interested in knowing about this device."	2.99	3.38	3.71	22.37**
Trialability Attributes[1]				
"The inability to try this device prior to purchase would make me hesitant to buy it." (reverse scored)	2.58	2.80	3.12	9.06**
"I find it difficult to judge how useful this device would be because I cannot try it out in advance." (reverse scored)	2.40	2.65	2.98	11.12**

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

10.3 Energy Conservation Scales

Respondents were asked to rate themselves on three energy conservation scales: (1) "conservation ethic" scale; (2) "motivation to conserve" scale; and (3) "energy conserver" scale. Each of these scales was measured by self-ratings on several different items.

Average self-ratings on items in the energy conservation scales for the three Auto Gas Saving Device interest segments are shown in Table 10.3. F-values from analyses of variance for the self-rated energy conservation items are also reported.

The major findings from Table 10.3 include:

- The positive interest segment scored higher, in general, on items related to motivation to conserve. They believed that real savings could be achieved through energy conservation.
- An interesting non-difference finding concerns the item "I try to drive less now than in the past." The positive interest segment scored non-significantly lower on this attribute than the other two segments.

TABLE 10.3

INTEREST GROUPS FOR AUTO GAS SAVING DEVICES
SELF-RATING ON ENERGY CONSERVATION SCALE

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	146	130	126	
Conservation Ethic Scale[1]				
"By conserving energy in the home I feel I am a better citizen."	3.55	3.67	3.63	0.74
"I pay attention to energy efficiency ratings when shopping for appliances."	3.31	3.28	3.39	0.45
"By conserving energy at home I also help prevent pollution."	3.56	3.63	3.61	0.29
"Conserving energy will save me money in the long run".	4.17	4.13	4.22	0.66
Motivation to Conserve Scale[1]				
"It would be hard for me to cut down on the use of energy in my home."	3.39	3.35	3.61	2.90*
"There is not much the average citizen can do to save energy."	3.92	3.81	3.89	0.64
"If I knew what to do I could save quite a bit of energy bills."	3.22	3.30	3.50	3.55**
Energy Conserver Scale[1]				
"I try to drive less now than in the past."	3.10	3.20	3.01	1.01
"I keep my thermostat lower than I did in past years."	3.40	3.50	3.36	0.67
"I turn lights off in my house whenever possible."	3.94	4.10	4.02	1.51
"In the winter I turn my thermostat down at night."	3.57	3.56	3.58	0.01

---

1. All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

10.4 Life Style Scales

Respondents were asked to rate themselves on a number of general life style scales. Each of these scales was measured by self-ratings on several different items. Average self-ratings for the three product interest segments for the Auto Gas Saving Devices are shown in Table 10.4. F-values from analyses of variance for the self-rated items are also reported.

In general there were few statistically significant or interesting life style correlates to Auto Gas Saving Device interest segments. One item, however, was particularly interesting. This item was "I think energy conserving devices are dependable" (F=8.23). This basic trust in the devices may partially explain why the positive interest segment is so favorable to the devices given the level of concern for the believability in the product claims.

TABLE 10.4

INTEREST GROUPS FOR AUTO GAS SAVING DEVICES
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	146	130	126	
Price Conscious Scale[1]				
"I shop a lot for 'specials'."	3.49	3.66	3.66	1.30
"I find myself checking prices in the store for even small items."	3.85	3.86	3.83	0.06
"I usually watch the advertisements for announcements of sales."	3.61	3.74	3.82	1.76
"A person can save a lot of money by shopping around for bargains."	3.74	3.82	3.92	1.50
Homebody Scale[1]				
"I would rather spend a quiet evening at home than go out to a party."	3.27	3.28	3.26	0.01
"I like parties where there is lots of music and talk." (reverse scored)	3.01	3.01	2.81	1.57
"I am a homebody."	3.35	3.27	3.18	0.83
Community Minded Scale[1]				
"I am an active member of more than one service organization."	2.60	2.69	2.78	1.07
"I do volunteer work for a hospital or service organization on a fairly regular basis."	2.54	2.72	2.69	1.08
"I like to work on community projects."	3.16	3.16	3.11	0.13

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

TABLE 10.4 (Continued)

INTEREST GROUPS FOR AUTO GAS SAVING DEVICES
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Va
Number of Respondents	146	130	126	
Credit User Scale[1]				
"I buy many things with a credit card or a charge card."	2.68	2.63	2.82	0.8
"I like to pay cash for everything I buy." (reverse scored)	2.52	2.39	2.45	0.5
"It is good to have charge accounts."	3.11	2.86	3.12	2.3
"To buy anything, other than a house or a car, on credit is unwise." (reverse scored)	2.90	2.54	2.89	3.9
Self-Confident Scale[1]				
"I think I have more self-confidence than most people."	3.25	3.18	3.29	0.5
"I am more independent than most people."	3.56	3.51	3.52	0.1
"I think I have a lot of personal ability."	3.66	3.62	3.67	0.2
"I like to be considered a leader."	3.05	2.92	3.06	0.9
Opinion Leader Scale[1]				
"My friends or neighbours often come to me for advice."	3.04	2.91	3.09	1.2
"I sometimes influence what my friends buy."	3.14	3.15	3.16	0.0
"People come to me more often than I go to them about products."	3.01	3.06	3.02	0.13

---

1. All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 10.4 (Continued)

INTEREST GROUPS FOR AUTO GAS SAVING DEVICES
SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Valu
Number of Respondents	146	130	126	
Information Seeker Scale[1]				
"I often seek out the advice of my friends regarding which product to buy."	3.08	2.93	2.92	1.16
"I spend a lot of time talking with my friends about products and brands."	2.80	2.69	2.90	1.51
"My neighbors or friends ussually give me good advice on which products to buy."	2.96	3.02	3.03	0.21
New Brand Trier Scale[1]				
"I often try new products before my friends and neighbours do."	3.03	2.90	2.93	0.79
"I like to try new and different things."	3.47	3.50	3.65	1.62
Financially Satisfied Scale[1]				
"Our family income is high enough to satisfy nearly all of our important desires."	3.69	3.57	3.74	1.11
"No matter how fast our income goes up, we never seem to get ahead." (reverse scored)	3.04	2.97	2.88	0.70
"I wish we had a lot more money." (reverse scored)	2.57	2.42	2.29	2.46*
Financial Optimist Scale[1]				
"I will probably have more money to spend next year than I have now."	3.04	2.92	2.98	0.49
"Five years from now our family income will probably be a lot higher than it is now."	3.33	3.42	3.39	0.28

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

* Statistically significant at $\alpha < .10$

TABLE 10.4 (Continued)

INTEREST GROUPS FOR AUTO GAS SAVING DEVICES SELF RATINGS ON SELECTED LIFE STYLE SCALES

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	146	130	126	
Gadgeter Scale[1]				
"I think mechanical gadgets are fun."	3.26	3.08	3.06	1.60
"I enjoy buying mechanical gadgets."	2.84	2.68	2.83	1.02
Concern for Reliability Scale[1]				
"I won't buy a major appliance unless it has a good warranty."	3.95	3.95	3.99	0.12
"I think energy conserving devices are dependable."	3.11	3.30	3.47	8.23**
Trust in System Scale[1]				
"Most big companies are only out to make a profit." (reverse scored)	2.36	2.50	2.34	0.98
"In my opinion we are facing energy shortages now."	3.29	3.35	3.45	0.78
"It is against the law to make false claims in advertising."	4.14	4.26	4.13	1.46

---

[1] All life style items were scored such that the higher the average, the more the life style scale was characteristic of the group of respondents.

** Statistically significant at $\alpha < .05$

10.5 Demographics and Household Characteristics

Respondents were asked to complete a questionnaire in which they provided basic demographic data as well as fairly detailed data on the characteristics of their household. These data are summarized in Table 10.5, with those respondents indicating no interest, ambivalence, or positive interest towards the Auto Gas Saving Device reported as three separate groups.

The most interesting observations that can be made about Table 10.5 include:

- The split among no interest, ambivalence, and positive interest (146, 130 and 126 respondents respectively) was the most nearly equal of all seven devices.
- Results with respect to the majority of household characteristics are uninteresting, although there is a slight tendency for respondents with larger homes to indicate a positive interest in Auto Gas Saving devices.
- Respondents with more than one vehicle in the household were more likely to express a positive interest in the device.
- In general, those respondents with higher annual fuel expenditures were more likely to indicate a positive interest in Auto Gas Saving devices.
- Older respondents were more likely to indicate a negative reaction to the devices.

Females were far more likely to indicate a positive interest in Auto Gas Saving devices than were males. Housewives also exhibited a tendency to indicate a positive attitude towards these devices.

- The retired respondents were strongly opposed to the device.

Middle and upper income respondents were more likely to view the Auto Gas Saving devices positively whereas the lower income respondents were more likely to indicate no interest in the device.

TABLE 10.5

AUTOMOBILE GAS SAVING DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	146	130	126
	%	%	%
Ownership of House:			
Own the house	95.1	94.4	96.7
Rent the house	4.9	5.6	3.3
Number of Rooms in the House:			
Three or less	2.1	3.2	3.3
4-5 rooms	39.9	41.3 ---**---	32.8
	└------------	------*------	------------┘
6-7 rooms	39.9	35.7	42.8
8-9 rooms	14.7	15.9	15.6
10 or more	3.5	4.0	6.6
	└------------	------*------	------------┘
Number of Floors in the House:			
One floor	61.8 ----*---	53.9	51.2
	└------------	------**------	------------┘
1 1/2 floors	11.1	10.9	9.8
2 floors	25.7	28.1	26.0
3 or more	1.4 ---**---	7.0 ---**---	13.0
	└------------	------**------	------------┘
Direction House Faces:			
North	27.3	27.0 ---*---	34.4
	└------------	------*------	------------┘
South	30.1	32.5	32.8
East	22.4	25.4 ---**---	18.0
West	20.3	15.1	14.8

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 10.5 (continued)

AUTOMOBILE GAS SAVING DEVICE INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest		
	No Interest	Ambivalent Interest	Positive Interest
Number of Respondents[1]	146	130	126
	%	%	%
Type of Heating Fuel:			
Natural gas	88.9	89.0	88.7
Heating oil	4.2	5.5	5.6
Electric	5.6	4.0	4.0
Other	1.4	1.6	1.6
Type of Hot Water Heater:			
Natural gas	81.7	78.0	74.2
	└──────	**	──────┘
Electric	18.3	22.0	25.8
	└──────	**	──────┘
Number of Vehicles in Household:			
None	8.5 ——**——	0.8	0.8
	└──────	**	──────┘
1 Vehicle	49.3	49.6	46.0
2 Vehicles	36.6	39.4	44.4
	└──────	*	──────┘
3 or more	5.6 ——*——	10.2	8.9
	└──────	*	──────┘

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 10.5 (continued)

AUTOMOBILE GAS SAVING DEVICE INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	146		130		126
	%		%		%
Annual Heating Bill:					
Under $200	1.6		1.8	—*—	5.0
	└—	—	*	—	—┘
$201 - 300	5.5		6.4	—*—	9.9
	└—	—	**	—	—┘
$301 - 400	18.0		14.7	—*—	19.8
$401 - 500	35.9		30.3	—**—	22.8
	└—	—	**	—	—┘
$501 - 600	17.2		20.2	—**—	11.9
	└—	—	*	—	—┘
$601 - 700	14.8		12.8		11.9
$701 - 800	3.9	—*—	7.3		5.0
$801 - 900	1.6		4.6	—*—	7.9
	└—	—	**	—	—┘
Over $900	1.6		1.8	—**—	6.0
	└—	—	**	—	—┘
Annual Electric Bill:					
Under $100	2.3		1.8		3.0
$101 - 200	17.2		19.3		17.0
$201 - 300	39.1	—**—	30.3		28.0
	└—	—	**	—	—┘
$301 - 400	23.4	—**—	33.9	—**—	26.0
$401 - 500	11.7		8.3	—*—	13.0
Over $500	6.3		6.4	—**—	13.0
	└—	—	**	—	—┘

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 10.5 (continued)

AUTOMOBILE GAS SAVING DEVICE INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	146		130		126
	%		%		%
Household Vehicle Gasoline Bill:					
Under $100	4.5		2.8		0.0
			**		
$101 - 200	5.4		2.8		4.1
$201 - 300	8.1		10.3	*	5.1
$301 - 400	12.6	**	7.5		5.1
			**		
$401 - 500	13.5		9.3	**	5.1
			**		
$501 - 600	9.0		6.5	**	15.3
			**		
$601 - 700	6.3		9.3		9.2
$701 - 800	4.5	**	8.4		8.2
$801 - 900	2.7	**	8.4		9.2
			**		
$901 - 1000	9.0		10.3		9.2
Over $1000	24.3		24.3		29.6
Confidence in Estimate of Fuel Bill:					
Very confident	47.3	**	31.3		35.0
			**		
Somewhat confident	42.6	**	56.3	*	48.5
Not very confident	8.5		8.9		12.6
Not confident at all	1.6		3.6		3.9
Does Respondent Pay Household Bills:[2]					
Respondent pays bills	63.0		56.2		55.6
			*		
Other person pays bills	41.1		50.0		50.0
			**		

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

2. Percentages add to more than 100% because many households have more than one person who pays the bills.

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 10.5 (continued)

AUTOMOBILE GAS SAVING DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	146		130		126
	%		%		%
Number of People in Household:					
One person	4.2		3.2	---*---	0.0
	└────	────	**	────	────┘
Two	33.3	---**---	24.2	---**---	16.3
	└────	────	**	────	────┘
Three	26.4	---*---	20.2		23.6
Four or Five	30.6	---**---	46.8	---**---	56.1
	└────	────	**	────	────┘
Six or more	5.6		5.6		4.1
Number of Children Under 18 in Household:					
None	55.1	---**---	40.0	---**---	30.3
One	16.7		21.7		18.9
Two	15.9	---**---	27.5	---*---	35.2
	└────	────	**	────	────┘
Three or four	10.9		10.8		14.8
Five or more	1.4		0.0		0.8

---

[1] Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 10.5 (continued)

AUTOMOBILE GAS SAVING DEVICE INTEREST SEGMENTS
DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest			
	No Interest		Ambivalent Interest	Positive Interest
Number of Respondents[1]	146		130	126
	%		%	%
Age:				
18-24	2.9	——**——	7.3	5.0
25-34	24.3	——*——	30.9	25.6
35-44	18.4	——**——	26.8	33.1
	└──────		──**──	──────┘
45-54	17.6		14.6	20.7
55-64	19.1	——**——	13.0	10.7
	└──────		──**──	──────┘
65 and over	17.6	——**——	7.3	5.0
Sex:				
Male	63.5	——**——	35.5	42.0
	└──────		──**──	──────┘
Female	36.5	——**——	64.5	58.0
	└──────		──**──	──────┘
Education:				
Ten years or less	19.2		16.8	16.6
11-13 years	33.3		32.0	35.0
Vocational	15.6	——**——	24.0	22.5
	└──────		──**──	──────┘
Some University	11.1		9.6	10.8
University graduate	20.7		17.6	15.0

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[1] Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

TABLE 10.5 (continued)

AUTOMOBILE GAS SAVING DEVICE INTEREST SEGMENTS DEMOGRAPHICS & HOUSEHOLD CHARACTERISTICS

	Level of Product Interest				
	No Interest		Ambivalent Interest		Positive Interest
Number of Respondents[1]	146		130		126
	%		%		%
Employment:					
Employed	51.9		50.4	——**——	61.2
	└──────		**		──────┘
Unemployed	5.2		5.7		8.3
Retired	20.7	——**——	8.9	——**——	4.1
Housewife	20.7	——**——	33.3	——*——	26.4
Student	0.0		0.8		0.0
Other	1.5		0.8		0.0
Household Income:					
under $5000	1.7		1.8		0.0
$5,000 - 9,999	9.2	——**——	4.5		3.7
	└──────		**		──────┘
$10,000 - 14,999	10.9	——**——	5.4	——**——	0.9
	└──────		**		──────┘
$15,000 - 19,999	8.4	——*——	13.4	——**——	7.3
$20,000 - 24,999	19.3		16.1		16.5
$25,000 - 29,999	14.3	——**——	21.4		23.9
	└──────		**		──────┘
$30,000 - 34,999	13.4		16.1		20.2
	└──────		**		──────┘
$35,000 - 39,999	5.0		7.1		8.3
$40,000 - 44,999	4.2		5.4		3.7
$45,000 - 49,999	3.4		3.6	——**——	7.3
	└──────		**		──────┘
Over $50,000	10.1	——*——	5.4		8.3

---

1. Percentages computed based only on respondents who answered the question. This differed slightly from the total number of respondents (non-response bias of approximately 5% on any particular question).

** Statistically significant at $\alpha < .05$
* Statistically significant at $\alpha < .10$

10.6 Conclusions

The product interest segments for the Auto Gas Saving Devices were analyzed in the previous sections in detail using several types of information: open-ended comments; ratings of diffusion factor attributes; self-ratings on energy conservation scales; self-ratings on life style scales; household characteristics; and personal demographics. The following discussion is based on the authors' interpretation of these results.

The majority of respondents in this study, irrespective of product interest segment, liked the concept of a device which could increase automobile gasoline mileage. Most of the exceptions were in the no interest segment where there were two sub-segments. One group did little or no driving and the other group was concerned about the proliferation of devices in the auto engine system.

The primary difference across the three product interest segments was in the nature of the disbelief in the claims for savings. The no interest segment was convinced that none of the Auto Gas Saving Devices could save. The ambivalent interest segment was skeptical of the claims and wanted proof of performance before considering adopting such a device. In contrast, the positive interest group did not have concrete doubts, but neither were they sure of the claims. The positive interest segment seemed willing to try the device even if they weren't totally sure.

Part of the explanation for the positive interest segment's willingness to try the devices in spite of being unsure can be seen in other data. The positive interest segment had reason to want to conserve: they believed conservation was possible for them; they had generally higher fuel bills; and they tended to have more than one car. Furthermore they were generally more trusting in device dependability.

One result that was, at first glance, surprising was that more females than males were positively interested and more males than females were not interested in the Auto Gas Saving Devices. Since, in the majority of households, the males are more likely to be interested in and responsible for automobile mechanisms, one would expect males to be more interested than females in these devices. One explanation for this finding is that there has developed extensive formal communications (e.g. news items) and word-of-mouth communications about the failure of these devices to demonstrate savings in objective tests. Males are much more likely to have heard about this than are females. As such the findings aren't surprising at all.

Overall what one sees in the comments and in the summary tables are indications that there exists strong interest in improved automobile mileage. Unfortunately the large number of unsuccessful Auto Gas Saving Devices has created strong negative opinions in the marketplace. If a device were to be developed that did increase mileage, that device would have to overcome the negative impressions that have been created by the current poor products.

11.0 OVERALL CONCLUSIONS AND RECOMMENDATIONS

This research has analyzed a number of factors affecting the diffusion of selected Domestic Automatic Energy Conserving Devices (DAECDs), namely, Water Heater Timers, Shower Flow Restrictors, Low Flow Showerheads, Setback Thermostats, Furnace Flue Dampers, Flue Heat Recovery Devices and Auto Gas Saving Devices. These seven devices were selected to represent DAECDs because these devices were designed solely to save residential energy.

Conclusions which emerged from the research can be discussed on three levels: (1) DAECDs generally, (2) product types within DAECDs and (3) specific DAECD products. Conclusions about each specific DAECD were reported in previous sections (4.6 - 10.6). This discussion will be limited to reviewing the more general conclusions.

General DAECD conclusions are based on results that tended to occur across all of the seven DAECDs tested. Two such broad conclusions were apparent. First, there was a great deal of incomplete and/or inaccurate information in the marketplace. Most respondents had never heard of the DAECDs. Those who had some awareness about a few of the devices talked as if that awareness was very vague. While unawareness about the availability of DAECDs was most common, there were differences among the DAECDs in the level of awareness. In particular, the Setback Thermostats and the Auto Gas Saving Devices were familiar to many.

The second general result was that there was no one identifiable group of individuals that viewed all or most DAECDs positively. That is, there was no one group of consumers that could be characterized as being "DAECD receptive". Rather there were individuals with differing perceptions and attitudes who were receptive to one or two specific devices. This was clearly demonstrated in Table 3.2.2 where it was shown that 80% of the respondents indicated positive interest in at least one device and only slightly more than 10% indicated positive interest in more than three devices.

In addition to these broad overall results, the research tended to show generally similar patterns of response for three types of DAECDs. These three types of DAECD are based on consumer perceptions of and attitudes toward the DAECDs. The three DAECD perceptual categories are Behavioural Replacement DAECDs, Unobtrusive DAECDs, and Behaviourally Obtrusive DAECDs.

The Behavioural Replacement DAECDs are devices which replace energy conservation behaviours thereby generally increasing the regularity, precision and efficiency of the energy conservaton efforts. The policymaker when considering a device that falls into this category should give prime consideration to two issues. First, how extensively has the public adopted the energy conserving behavior? There is little value in a program designed to encourage the adoption of a device if all that the device accomplishes is an alternate means to achieve the same savings (this problem was observed with the Setback Thermostats, see section 7.6).

The second issue to be addressed in the Behavioural Replacement Devices is how to encourage the diffusion of such a device once a decision has been made that it would be worthwhile. The answer to this issue was abundantly clear in the results -- emphasize the automatic convenience of the device. For this category of device, it is less necessary to convince consumers to save as much as it is desirable to inform them that the device can make achieving savings easier.

Unobtrusive devices such as flue heat recovery devices, furnace flue dampers and automobile gas saving devices, once purchased, would be installed and then in great part -- forgotten. These devices would not replace or impact upon any behaviour of the homeowner and as such respondents in the study clearly indicated that the relevant evaluative criteria for these devices would be their cost and their benefits. Relative advantage is clearly the key factor in determining the speed with which unobtrusive devices diffuse in Canada. Policies aimed at increasing the rate of diffusion of unobtrusive DAECDs will be effective only if they reduce this perceived cost/benefit ratio. Non-financial, persuasive policies (information campaigns) would be useful to communicate the magnitude of the potential benefits to the consumers. The main drawback for these devices quite often is their purchase and installation prices. Government programs aimed at assisting the consumers with this initial cost are recommended for unobtrusive devices. Unfortunately not all unobtrusive devices are equally effective in reducing residential energy consumption. For devices such as certain automobile gimmicks which have proven to be ineffective policiey initiatives should focus on maximizing the perceived cost/benefit ratio by clearly communicating to consumers the minimal benefits to be expected from using this product.

Behaviourally obtrusive devices comprise the most interesting category of DAECD. Although national energy savings may not be as substantial as for the unobtrusive DAECDs these more obtrusive products (eg. water heater timer, shower flow restrictor) require completely different policy initiatives in order to diffuse more rapidly. The main problem with these Behaviourally obtrusive devices, as expressed by the respondents, is not their costs or benefits (relative advantage) but several lifestyle problems. As long as the lifestyle problems exist, the issue of relative advantage remains trivial. It is important, from a policy perspective to appreciate on a product-by-product basis within this category the nature of the behavioural or lifestyle barrier to diffusion prior to attempting to convince people to adopt the device. Whereas with the unobtrusive devices it would be sufficient to address the costs and benefits of the device, this study clearly indicated that certain devices -- behaviourally obtrusive devices -- will not diffuse more quickly as a result of policies designed to influence relative advantage. The behavioural or lifestyle issues must be dealt with first. For example, it is insufficient to tell consumers that the shower flow restrictor is cheap and that it will save them money and energy because consumers are more interested in shower quality and at current energy price levels are unwilling to trade shower quality for dollar savings. Similarly, water heater timers will be accepted only if consumers can be convinced that there will be no inconvenience, and that they will have hot water when they want it. Clearly cost and energy savings are secondary considerations with respect to the speed of diffusion of this category of DAECD.

The DAECDs used in this study are representative of a much larger group of energy saving devices and in no way should be construed as constituting all of the DAECDs currently on the market. Due to the length of the interview process the original sample of ten DAECDs had to be reduced to a more manageable, yet representative, sample of seven devices. The sample was sufficient to illustrate the distinctions among behavioural replacement DAECDs, unobtrusive DAECDs, and behaviourally obtrusive DAECDs.

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APPENDIX A

SELECTED OPEN-ENDED COMMENTS

During the open-ended discussion portion of the interviews, the volunteered comments were recorded using key words or phrases. Selected examples of these key word comments are listed for each device and interest segment separately. The authors added an occasional word in brackets ( ) to increase the readability of some key word phrases.

TABLE OF COMMENTS

Page

Water Heater Timers: No Interest Segment A1
" " " Ambivalent Interest Segment A2
" " " Positive Interest Segment A3

Show Flow Restrictors: No Interest Segment A4
" " " Ambivalent Interest Segment A5
" " " Positive Interest Segment A6

Low Flow Showerheads: No Interest Segment A7
" " " Ambivalent Interest Segment A8
" " " Positive Interest Seqment A9

Setback Thermostats: No Interest Segment A10
" " " Ambivalent Interest Segment A11
" " " Positive Interest Segment A12

Furnace Flue Dampers: No Interest Segment A13
" " " Ambivalent Interest Segment A14
" " " Positive Interest Segment A15

Flue Heat Recovery Devices: No Interest Segment A16
" " " " Ambivalent Interest Segment..... A17
" " " " Positive Interest Segment A18

Auto Gas Saving Devices: No Interest Segment A19
" " " " Ambivalent Interest Segment A20
" " " " Positive Interest Segment A21

WATER HEATER TIMERS: NO INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Water Heater Timers by individual respondents in the no interest segment:

- "use hot water so many times during day - would be more frustrating than it's worth - an inconvenience"
- "wouldn't change life style for $5 per month savings"
- "we have kids using water all the time"
- "with a baby need hot water all day"
- "like hot water constantly at my fingertips"
- "can't tell when we'll do dishes"
- "impossible for me - I do wash when the mood hits me"
- "don't plan day so far ahead so would know when need hot water"
- "big nuisance to set all the time"
- "we keep our hot water low so that it is not so hot now"
- "pay flat rate in Winnipeg - so wouldn't save anything here"
- "not sure about the savings - manufacturers may lie"
- "would be more expensive to reheat cold water"
- "not a lot of savings"

WATER HEATER TIMERS: AMBIVALENT INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Water Heater Timers by individual respondents in the ambivalent interest segment:

- "don't know till try it"
- "don't really understand it"
- "not sure usage of water in house is conducive to the device - someone always home"
- "have to reset on Saturdays and Sundays"
- "no point in heating hot water on weekends when away (but) could do it manually"
- "price is good"
- "install yourself"
- "saves $5 per month"
- "in Nova Scotia would consider cost of heating it (water) - (but) energy is cheaper out here"
- "hot water heater well insulated"
- "wouldn't take long to pay back - 6 months - (but have) irregular hours"
- "save hot water bill (but) price is high if you have to get an electrician"

WATER HEATER TIMERS: POSITIVE INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Water Heater Timers by individual respondents in the positive interest segment:

- "sounds like a good idea"
- "good idea - saves good"
- "save a lot on gas bill"
- "save \$5 per month for \$30 cost is good"
- "cheap"
- "don't use hot water at night"
- "lots of time when you don't need hot water"
- "during the day no one uses hot water - therefore savings"
- "good when kids in school, wife works in winter"
- "install yourself"
- "good for water heater - lasts longer"
- "saves wear and tear on tank and elements"
- "use only as you need it rather than having tank work so much"
- "where can you get that? Need in cottage"

SHOWER FLOW RESTRICTORS: NO INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Shower Flow Restrictors by individual respondents in the no interest segment:

- "no - I like to have a good shower and don't care how much water I use"
- "like lots of pressure and hot water when shower"
- "don't want to stand under a shower with a little water coming out"
- "reduces shower quality"
- "may want to take longer showers with it"
- "can't see it saving anything"
- "bit of a frill"
- "water heating costs not that high"
- "can turn tap down myself"
- "not a showering family - bath"
- "no shower in home"
- "my husband wouldn't put it in even if simple"
- "need to know that it works by friends"
- "I like the other one (low flow showerhead) better"

SHOWER FLOW RESTRICTORS: AMBIVALENT INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Shower Flow Restrictors by individual respondents in the ambivalent interest segment:

- "savings on heating (but) I don't know much about (it)"
- "don't know if too much water is wasted anyway"
- "kids wouldn't deplete all the hot water (but) I like a lot of pressure in shower"
- "looks good (but) not sure how long it would last"
- "depends on how minor the reductions in shower quality are"
- "have to see it"
- "never used it - don't know"
- "have to try it first"
- "don't know of anyone having it"
- "would you get the same amount of water power?"
- "could turn it down with tap"
- "end up taking longer shower"
- "costs reasonable"
- "savings on energy"
- "saves water"

SHOWER FLOW RESTRICTORS: POSITIVE INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Shower Flow Restrictors by individual respondents in the positive interest segment:

- "like very much"
- "where do you get it? Very interested"
- "definitely cuts the amount of water used"
- "saves 12%"
- "anything that saves on water bill"
- "would buy it if tried it and liked it"
- "take a lot of showers, long showers"
- "good idea - kids always in shower"
- "would save - husband stands there a long time"
- "economical - you can sacrifice some less water for savings"
- "price reasonable"
- "cheap - easy to replace"
- "simple to install"
- "simple to use"

LOW FLOW SHOWERHEADS: NO INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Low Flow Showerheads by individual respondents in the no interest segment:

- "tried one - didn't like it"
- "like all the water I can get"
- "prefer hand held shower"
- "not pulsating type"
- "have Water Pic - can cut water flow down same as this"
- "all you have to do is close the valve to restrict flow"
- "don't believe it - 12% of bill reduced by warm water used"
- "don't have children at home any more - not as useful"
- "sounds like a gimmick"
- "small washer would do the same job"
- "don't use shower too much - prefer bath"
- "we don't have a shower"
- "no one uses the shower very much"
- "wouldn't replace showerhead now - would wait until new showerhead is needed"

LOW FLOW SHOWERHEADS: AMBIVALENT INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Low Flow Showerheads by individual respondents in the ambivalent interest segment:

- "good idea to save energy but we don't like to cut our comforts - we think a great deal of our shower"
- "saves on heating water (but) have to contend with husband"
- "saves a lot of water, especially with kids (but) have to use it to say more"
- "one more mechanism I wouldn't understand"
- "take advice of plumber"
- "would have to see it working"
- "would you have as good a shower?"
- "12% savings quite good" - "have to figure out how much it would save"
- "not that much money going out in water bill"
- "depends on how you handle showers"
- "don't know if we would get $27 satisfaction out of it"
- "any outlay of cash I would have to think about even if useful"
- "easily installed - $27 isn't bad (but) don't believe it wouldn't reduce forcefulness"

LOW FLOW SHOWERHEADS: POSITIVE INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Low Flow Showerheads by individual respondents in the positive interest segment:

- "good idea - easy way to save money"
- "water not too expensive but save on heating"
- "savings are good"
- "use less water and probably have the same benefit"
- "doesn't reduce forcefulness of spray"
- "use shower a lot - therefore savings good"
- "whole idea appeals to me - big house - lot of people showering - good savings"
- "probably pay for itself in a short while"
- "inexpensive"
- "can be installed yourself"
- "put on any type of shower"
- "looks attractive"
- "have heard of it - thought good idea"

SETBACK THERMOSTATS: NO INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Setback Thermostats by individual respondents in the no interest segment:

- "we turn down the heat at night - I never forget"
- "would be useful but just as easy to do it yourself"
- "for lazy people who don't turn it down - we turn it down"
- "good for others"
- "can turn it down manually - sounds like a gimmick"
- "price is not bad (but) we are energy conscious - automatically turn down our thermostat - a waste of funds"
- "heating up cold house uses more energy than just leaving it at a moderate temperature"
- "never touch thermostat - keep it at 70 all the time"
- "on certain days you don't want thermostat turned up or down automatically"
- "like to change thermostat myself - something may go wrong with an automatic system"
- "we have enough push button things"
- "have a thermostat that works well and don't want to change it"
- "we have adequate insulation"
- "5% is not enough savings"

SETBACK THERMOSTATS: AMBIVALENT INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Setback Thermostats by individual respondents in the ambivalent interest segment:

- "might get some savings"
- "5% savings not that good"
- "saves money (but dislike the) price"
- "savings on fuel bill (but) need to talk it over with my wife"
- "need to know more on how it works"
- "I would find out more about it before I bought it, $45 is $45"
- "need more time to decide"
- "reducing heat at night (but) pain to install"
- "pay for itself in a year (but) worried about high installation"
- "trained serviceman may be expensive"

SETBACK THERMOSTATS: POSITIVE INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Setback Thermostats by individual respondents in the positive interest segment:

- "like automatic - I never do it otherwise"
- "don't have to do it manually"
- "when wife working it would be useful to cut back heat during day and it would still be warm when come home"
- "I sometimes forget to turn it down - it would do the remembering for me"
- "turn it up before you get up in morning"
- "saves $ - if you forget still done"
- "savings very good"
- "saves energy - especially at night - friends have said it would be useful"
- "savings quite good for the price"
- "definitely the savings - everyone is fiddling with thermostat"
- "we have talked about getting one - like automatic part"
- "simple to install"
- "my children have it in their home - they like it"
- "set it to come on in the morning - don't freeze"
- "sometimes we forget to turn heat off and have to jump from bed to turn down heat"

FURNACE FLUE DAMPERS: NO INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Furnace Flue Dampers by individual respondents in the no interest segment:

- "$250 for a little thing like that"
- "too expensive - would not pay for itself"
- "useful for savings except too costly"
- "I don't think 15% savings on heating bill is worth the cost of $250"
- "don't believe the 15% savings"
- "would probably have an energy saving furnace before this"
- "my furnace is new and working well"
- "just had a furnace check, in good working condition - why add more problems?"
- "afraid of fume feedback"
- "dangerous, don't know how safe, especially with house all closed up"
- "wonder how dangerous it would be if valve didn't open"

FURNACE FLUE DAMPERS: AMBIVALENT INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Furnace Flue Dampers by individual respondents in the ambivalent interest segment:

- "saves energy and heat money - (but) price is high - more information needed"
- "claims are very good - savings - (but) high cost of installation"
- "looks good - like savings (but) too complicated"
- "saves money (but) may be dangerous"
- "like savings (but) would have to be convinced of savings"
- "don't know - depends on cash flow"
- "money is a factor - need to talk to someone else"
- "never seen - have to see it on someone else's"
- "undecided because I don't know too much about furnaces"
- "I don't make the decision"
- "make sense - savings"
- "heating bills not too bad in this house (but) savings on heating bill still nice"
- "automatically closes - we would install this if bought a new furnace"
- "price is too high for pensioner - perhaps if subsidized would be interested"
- "idea makes sense (but) don't think it will pay back"
- "very expensive way of reducing heat loss"
- "concerned with installation quality"
- "automatic damper may cause troubles - don't work 100% of the time"

FURNACE FLUE DAMPERS: POSITIVE INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Furnace Flue Dampers by individual respondents in the positive interest segment:

- "sounds good - save a lot"
- "saves heat - makes sense"
- "save that much on heat"
- "if they save 15% - its useful"
- "good idea - save on the long run"
- "makes sense - savings - should pay for itself"
- "cost ok"
- "good idea - save heat - and costs not bad"
- "doesn't take up any extra space"
- "I think we are getting this - no hot air escapes"
- "I just had the house insulated and it helped - this would also save"
- "looks efficient"
- "good idea - some heat - and costs not bad"

FLUE HEAT RECOVERY DEVICES: NO INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Flue Heat Recovery Devices by individual respondents in the no interest segment:

- "only save 8%"
- "8% savings not very good - only $32 per year"
- "8% not that much savings - I would rather insulate attic and basement"
- "there are better ways to save heat"
- "insulate house is more important"
- "other things on market that would save you more"
- "years to pay off at 8% of bill"
- "savings not as good as flue dampers"
- "saves energy (but) costs a lot for what it saves"
- "spend too much overall to save"
- "we just had a new gas furnace put in and my gas bill isn't too bad"
- "have good insulation so heat loss isn't too bad"
- "make air stale"
- "sounds dangerous"
- "what are odds of getting noxious fumes in house"
- "wouldn't work with steam heat"

FLUE HEAT RECOVERY DEVICES: AMBIVALENT INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Flue Heat Recovery Devices by individual respondents in the ambivalent interest segment:

- "would like to see it in operation or see someone else have it first"
- "not familiar with it at all"
- "I would like to speak to someone who has one"
- "if it does what its supposed to do not bad - I would have to see it in operation before I would buy it"
- "really don't know if it is good or bad"
- "I don't know enough about furnaces to know how much air is being lost"
- "don't understand it"
- "I don't make the decision"
- "a little too complicated"
- "I don't know too much about mechanical aspects"
- "what warranty is there?"
- "price is too high - might not save as much as put in"
- "saves 8% on bill - not very much but saves some"
- "saves energy (but dislike) payback period 4 years"
- "cost is a little high according to saving"
- "sounds good but I think if you insulate will get same effect"
- "we are well insulated"
- "sounds useful - need visual proof"

FLUE HEAT RECOVERY DEVICES: POSITIVE INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Flue Heat Recovery Devices by individual respondents in the positive interest segment:

- "could be significant savings on heating"
- "good idea - saves heat and money"
- "save fuel that would have been wasted"
- "anything you can do to cut down heating bill is good"
- "if it works like it says - would pay off in a year"
- "heard they work, 2-3 years to pay off makes sense"
- "reasonable claims - claims not out of line at 8%"
- "if manufacturer claims you can save 8%, I'm interested in using it"
- "husband has explained it - says its good - saves money"
- "it is worth investigating"
- "pretty minimal cost"
- "not too expensive"
- "makes sense and price more reasonable than $449 (furnace flue damper)"
- "looks like it has good safety features"
- "efficient for certain furnaces"

AUTO GAS SAVING DEVICES: NO INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Auto Gas Saving Devices by individual respondents in the no interest segment:

- "I've got one on the truck cost $90 and is not worth 2 cents"
- "they have not been proved to be any good"
- "I would have to see proof of that"
- "rip-off - don't work"
- "heard - seen consumer reports - don't live up to claims"
- "have seen on marketplace - don't do what claimed"
- "so many claims that I have no faith in them"
- "bought one something like (this) - car kept stalling, lousy"
- "lose power - horse power in your car"
- "don't think I'd feel very safe - cutting fuel line"
- "very concerned about car manufacturer's warranty"
- "just another thing under hood that can go wrong"
- "new cars already have so much extra"
- "don't use car enough at high speeds"
- "just keep car properly tuned"
- "we have a small car which is pretty good on gas"
- "company pays for gas"
- "not too worried about saving gas - why worry about little things like this?"

AUTO GAS SAVING DEVICES: AMBIVALENT INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Auto Gas Saving Devices by individual respondents in the ambivalent interest segment:

- "if it lived up to it's claims - very useful"
- "saves gas - gas getting so expensive"
- "saves gasoline and thus saves money - if it works (but) skeptical"
- "won't buy it until proven to work"
- "not sure if it works as it says it does"
- "dubious - bad ones in past"
- "uses 25% less gas, only cost $7, how come everybody doesn't have one?"
- "gas is expensive and it saves on gas (but) don't understand how it works or if it works"
- "not sure about cars - cutting fuel line bothers"
- "want to hear more about it"
- "husband makes decision"
- "my husband does the car stuff - difficult for me to answer"
- "I don't know what our cars have - too many gadgets around"
- "not sure if it is a good system for your engine"

AUTO GAS SAVING DEVICES: POSITIVE INTEREST SEGMENT

The following is a selection of specific comments which were volunteered about Auto Gas Saving Devices by individual respondents in the positive interest segment:

- "sounds reasonable - conserves gas"
- "drive a lot - save on gas"
- "saves gas - car hard on gas"
- "savings good - two cars"
- "if information claims were true - save"
- "saves gas - if it works - have to look into it"
- "if it does as claims - good - saves gas"
- "if it saves, its good"
- "pretty good - everyone is looking for savings in gas"
- "saves gas and cost reasonable"
- "cost is not too bad"
- "the economics - cost versus savings"
- "pay for it in no time at all"
- "(can) install (it) yourself"
- "have a van that burns a lot of gas (but) hesitate to buy something I don't know much about"
- "reduced gas consumption - cost is cheap (but) how will it affect car warranty"
- "seems like a good idea (but) not sure how it works"

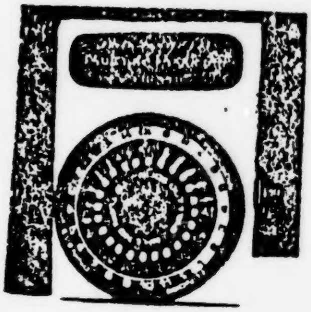
APPENDIX B

INTERVIEW MATERIALS

ELECTRIC WATER HEATER TIMER

WHAT IS IT?

IT IS A DEVICE WHICH CONTROLS THE HEATING OF WATER THROUGHOUT THE DAY.



FUNCTION: CYCLES THE HEATER ON ONLY AT THE TIMES OF THE DAY WHEN HOT WATER IS NORMALLY NEEDED.

MANUFACTURER'S CLAIMS:

SAVINGS:	$5 PER MONTH.
COST:	$30.
INSTALLATION:	CAN INSTALL YOURSELF, MAY WANT TO CALL AN ELECTRICIAN.

SHOWER FLOW RESTRICTORS

WHAT IS IT?

A WATER RESTRICTOR IS A PIPE SEGMENT ADDED BETWEEN THE SHOWER PIPE AND THE SHOWER HEAD.

FUNCTION: A RESTRICTOR CUTS WATER USAGE AND THUS REDUCES THE AMOUNT OF HOT WATER USED, WITH MINOR REDUCTIONS IN SHOWER QUALITY.

MANUFACTURER'S CLAIMS:

SAVINGS:	1[illegible] OF WATER HEATING BILL.
COST:	$5.
INSTALLATION:	VERY SIMPLE.

LOW FLOW SHOWERHEAD

WHAT IS IT?

REPLACEMENT SHOWERHEAD WHICH REDUCES WATER FLOW BY AS MUCH AS 66%.

NOVA
B6402
for residential use

FUNCTION: TO REDUCE THE AMOUNT OF HOT WATER USED, WITHOUT REDUCING FORCEFULLNESS OF SPRAY.

MANUFACTURER'S CLAIMS:

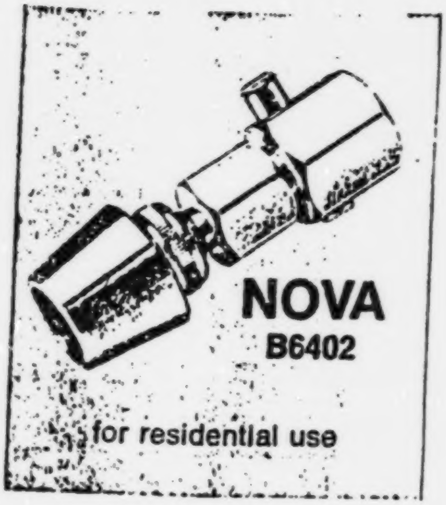
SAVINGS: 12% OF WATER HEATING BILL

COST: $7.

INSTALLATION: EASILY INSTALLED.

WHAT IS IT?

REPLACEMENT SHOWERHEAD WHICH
REDUCES WATER FLOW BY AS
MUCH AS 66%.


NOVA
B6402
for residential use

FUNCTION: TO REDUCE THE AMOUNT OF HOT WATER USED,
WITHOUT REDUCING FORCEFULLNESS OF SPRAY.

MANUFACTURER'S CLAIMS:

SAVINGS: 12% OF WATER HEATING BILL.

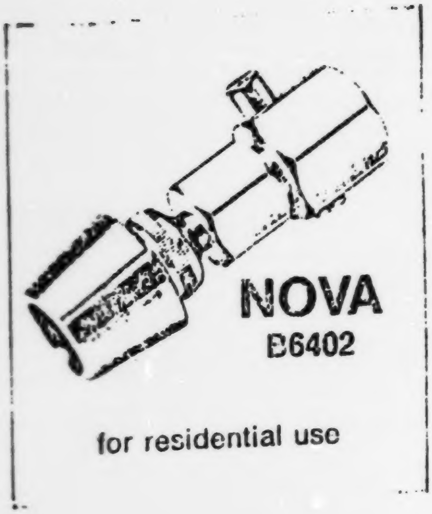
COST: $15.

INSTALLATION: EASILY INSTALLED.

LOW FLOW SHOWERHEAD

WHAT IS IT?

REPLACEMENT SHOWERHEAD WHICH REDUCES WATER FLOW BY AS MUCH AS 66%.



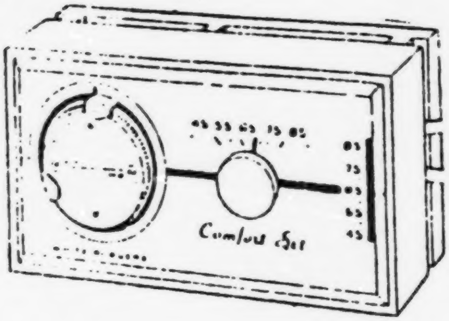
FUNCTION: TO REDUCE THE AMOUNT OF HOT WATER USED, WITHOUT REDUCING THE FORCEFULNESS OF SPRAY.

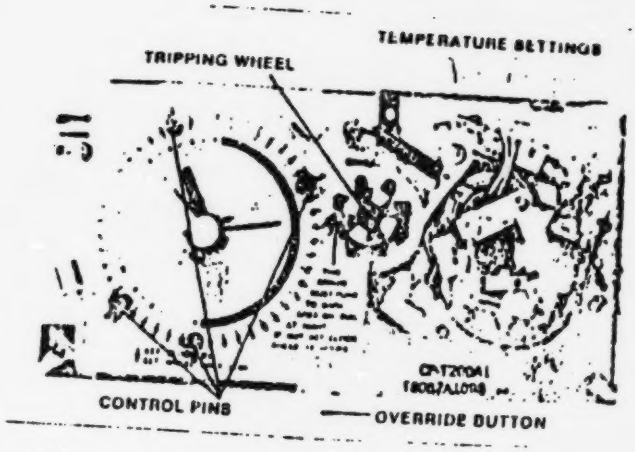
MANUFACTURER'S CLAIMS:

SAVINGS:	12% OF WATER HEATING BILL
COST:	$27.
INSTALLATION:	EASILY INSTALLED.

HAT IS IT?

DEVICE WHICH ALLOWS
)U TO AUTOMATICALLY
)NTROL THE THERMOSTAT.





THE TOP-RATED THERMOSTAT

The *Honeywell CPT200A* (shown without cover) can control up to three setback periods a day. Pins set in the 24-hour timer dial trip the center wheel, switching the temperature from normal to setback, or vice versa. A useful (and exclusive) feature on the *Honeywell* is the override button, which can switch the temperature to normal when it is set back, or vice versa. That feature allows easy adjustment of setback periods when your schedule changes, as it might over a weekend.

FUNCTION: AUTOMATICALLY REDUCES THERMOSTATS AT SPECIFIED TIMES OF DAY/NIGHT.

MANUFACTURER'S CLAIMS:

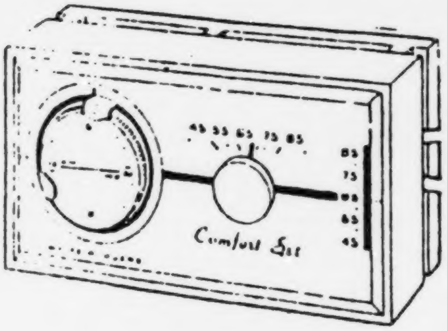
SAVINGS: 5% OF FUEL BILL.

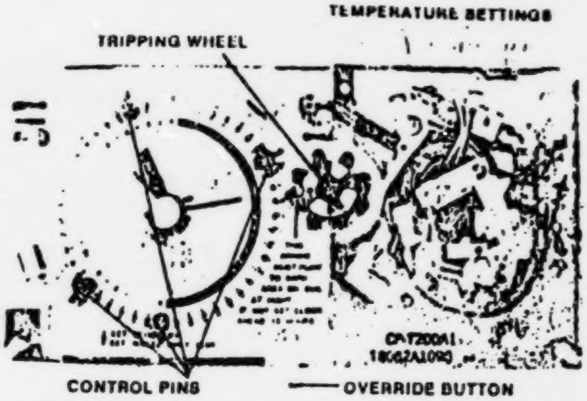
COST: $45 PLUS INSTALLATION.

INSTALLATION: SHOULD BE DONE BY A TRAINED SERVICEMAN.

WHAT IS IT?

A DEVICE WHICH ALLOWS YOU TO AUTOMATICALLY CONTROL THE THERMOSTAT.


45 55 65 75 85
85
75
65
45
Comfort Set


TEMPERATURE SETTINGS
TRIPPING WHEEL
CONTROL PINS
OVERRIDE BUTTON
CPT200A1

THE TOP-RATED THERMOSTAT

The *Honeywell CPT200A* (shown without cover) can control up to three setback periods a day. Pins set in the 24-hour timer dial trip the center wheel, switching the temperature from normal to setback, or vice versa. A useful (and exclusive) feature on the *Honeywell* is the override button, which can switch the temperature to normal when it is set back, or vice versa. That feature allows easy adjustment of setback periods when your schedule changes, as it might over a weekend.

FUNCTION: AUTOMATICALLY REDUCES THERMOSTATS AT SPECIFIED TIMES OF DAY/NIGHT.

MANUFACTURER'S CLAIMS:

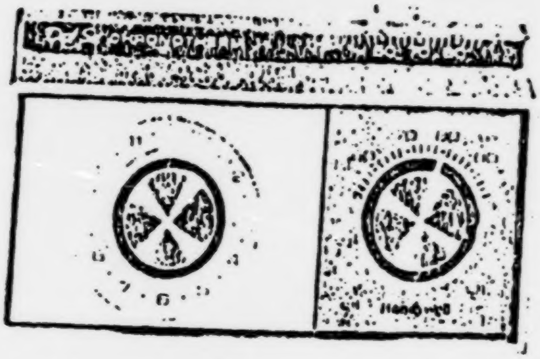
SAVINGS: 15% OF FUEL BILL.

COST: $45 PLUS INSTALLATION.

INSTALLATION: SHOULD BE DONE BY A TRAINED SERVICEMAN.

A DEVICE WHICH ALLOWS
YOU TO AUTOMATICALLY
CONTROL THE THERMOSTAT.

Energy-Saving Thermostats



FUNCTION: AUTOMATICALLY REDUCES THERMOSTATS AT SPECIFIED TIMES OF DAY/NIGHT.

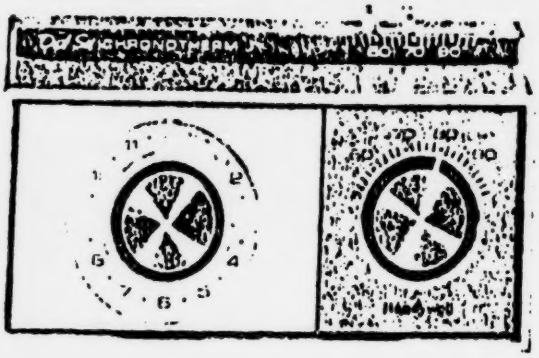
MANUFACTURER'S CLAIMS:

SAVINGS:	5% OF FUEL BILL.
COST:	$45 PLUS INSTALLATION.
INSTALLATION:	SHOULD BE DONE BY A TRAINED SERVICEMAN.

WHAT IS IT?

A DEVICE WHICH ALLOWS YOU TO AUTOMATICALLY CONTROL THE THERMOSTAT.

Energy-Saving Thermostats



FUNCTION: AUTOMATICALLY REDUCES THERMOSTATS AT SPECIFIED TIMES OF DAY/NIGHT.

MANUFACTURER'S CLAIMS:

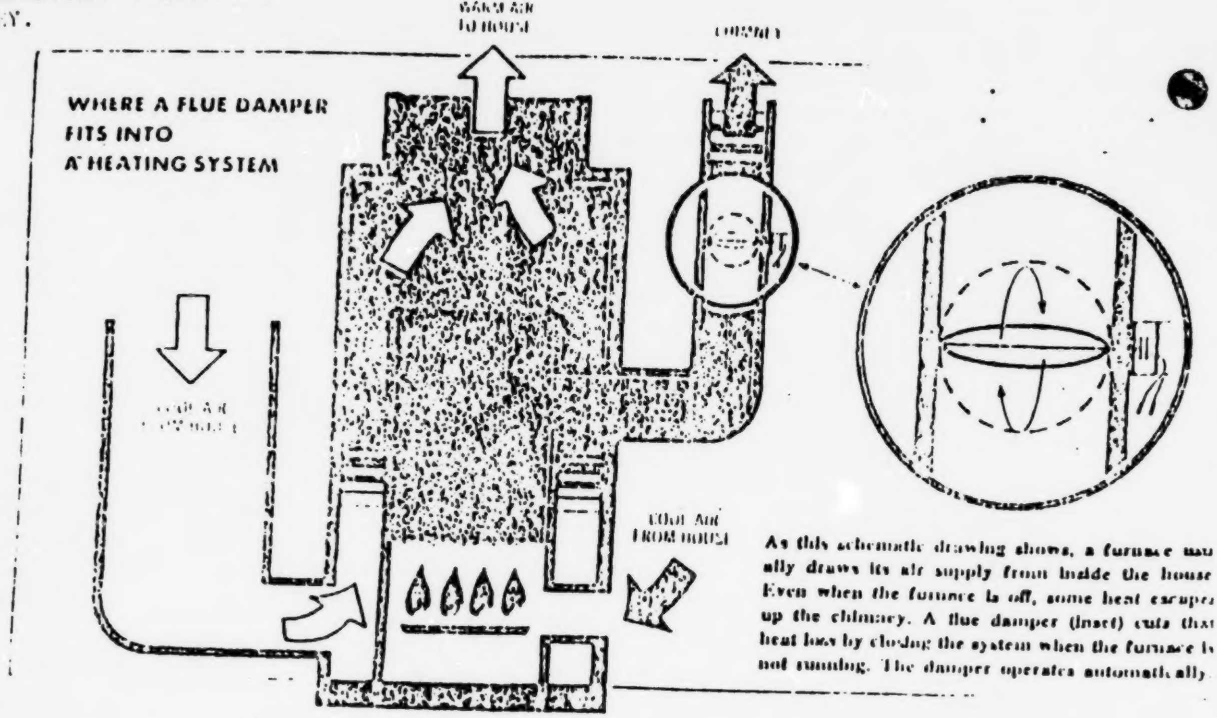
SAVINGS: 15% OF FUEL BILL.

COST: $45 PLUS INSTALLATION.

INSTALLATION: SHOULD BE DONE BY A TRAINED SERVICEMAN.

WHAT IS IT?

A VALVE THAT PREVENTS HOT AIR FROM ESCAPING THROUGH THE CHIMNEY.



WHERE A FLUE DAMPER FITS INTO A HEATING SYSTEM

As this schematic drawing shows, a furnace usually draws its air supply from inside the house. Even when the furnace is off, some heat escapes up the chimney. A flue damper (inset) cuts that heat loss by closing the system when the furnace is not running. The damper operates automatically.

FUNCTION: THE FLUE DAMPER AUTOMATICALLY CLOSES THE FLUE OF THE FURNACE WHEN THE FURNACE IS OFF, THEREBY PREVENTING HEAT LOSS.

MANUFACTURER'S CLAIMS:

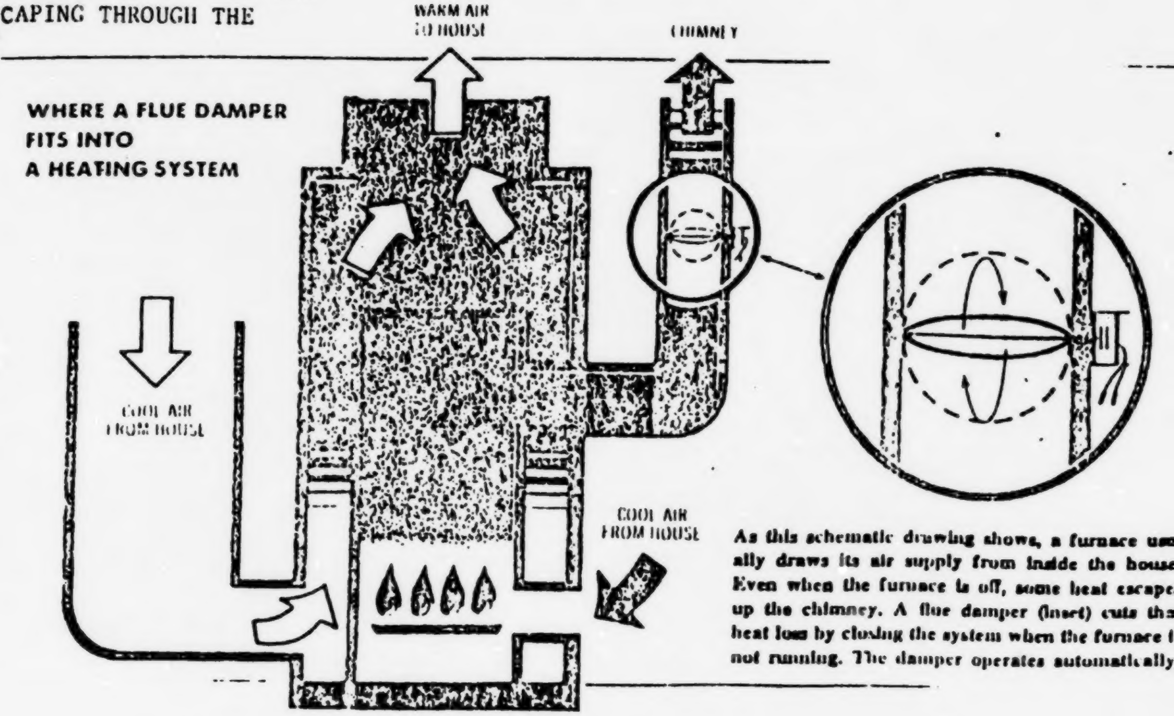
SAVINGS: 15% OF ANNUAL HEATING BILL.

COST: $250 INCLUDING INSTALLATION.

INSTALLATION: MUST BE INSTALLED BY A TRAINED EXPERT, BECAUSE IMPROPER INSTALLATION COULD BE DANGEROUS.

WHAT IS IT?

A VALVE THAT PREVENTS HOT AIR FROM ESCAPING THROUGH THE CHIMNEY



WHERE A FLUE DAMPER FITS INTO A HEATING SYSTEM

As this schematic drawing shows, a furnace us ally draws its air supply from inside the hous Even when the furnace is off, some heat escape up the chimney. A flue damper (insert) cuts th heat loss by closing the system when the furnace i not running. The damper operates automatically

FUNCTION: THE FLUE DAMPER AUTOMATICALLY CLOSES THE FLUE OF THE FURNACE WHEN THE FURNACE IS OFF, THEREBY PREVENTING HEAT LOSS.

MANUFACTURER'S CLAIMS:

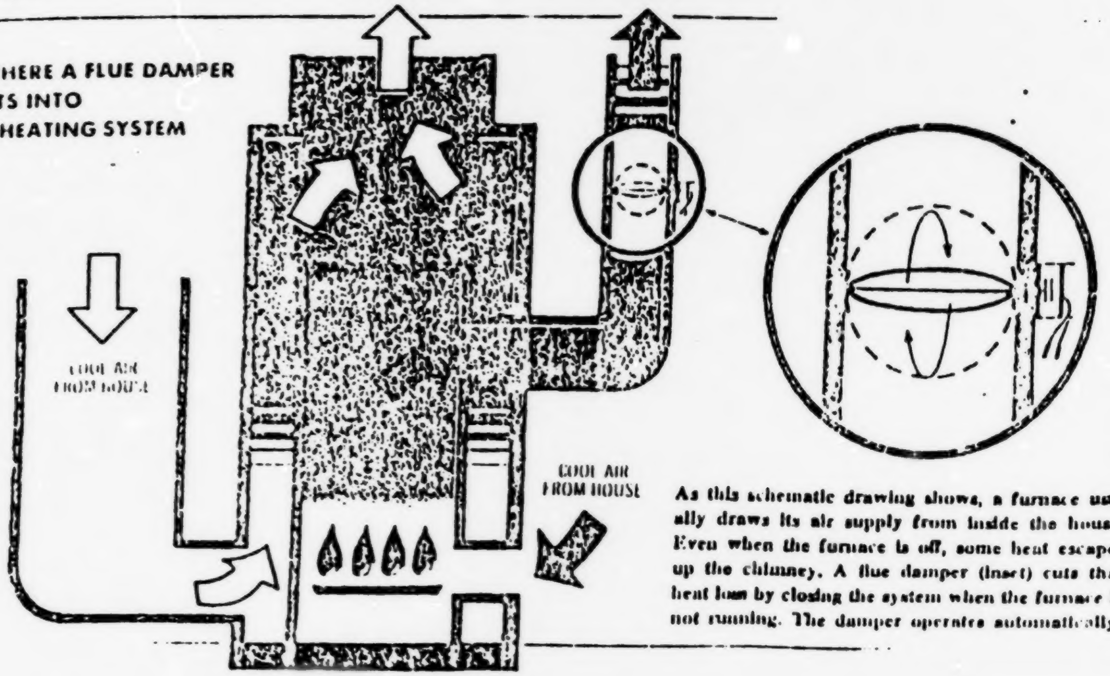
SAVINGS: 15% OF ANNUAL HEATING BILL.

COST: $325 INCLUDING INSTALLATION.

INSTALLATION: MUST BE INSTALLED BY A TRAINED EXPERT, BECAUSE IMPROPER INSTALLATION COULD BE DANGEROUS.

A VALVE THAT PREVENTS HOT AIR
FROM ESCAPING THROUGH THE
CHIMNEY.

WHERE A FLUE DAMPER FITS INTO A HEATING SYSTEM



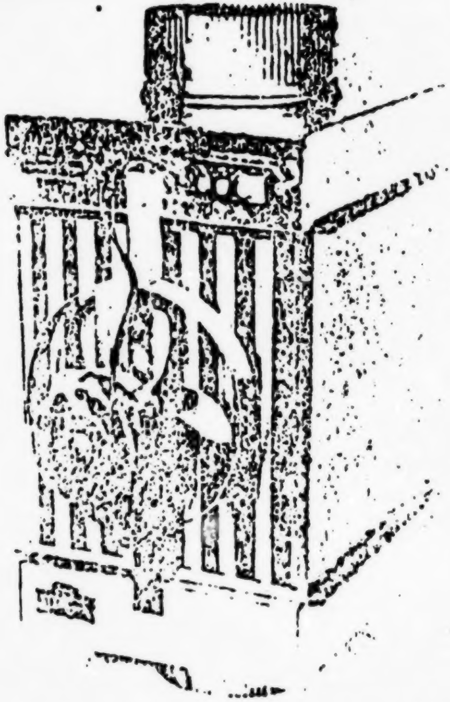
As this schematic drawing shows, a furnace usually draws its air supply from inside the house. Even when the furnace is off, some heat escapes up the chimney. A flue damper (inset) cuts that heat loss by closing the system when the furnace is not running. The damper operates automatically.

FUNCTION: THE FLUE DAMPER AUTOMATICALLY CLOSES THE
FLUE OF THE FURNACE WHEN THE FURNACE IS
OFF, THEREBY PREVENTING HEAT LOSS.

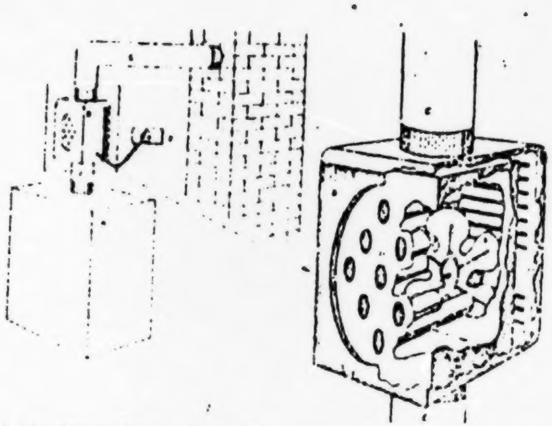
MANUFACTURER'S CLAIMS:

SAVINGS:	15% OF ANNUAL HEATING BILL.
COST:	$449 INCLUDING INSTALLATION.
INSTALLATION:	MUST BE INSTALLED BY A TRAINED EXPERT, BECAUSE IMPROPER INSTALLATION COULD BE DANGEROUS.

FLUE HEAT RECOVERY DEVICE



Heat reclaimer. This make is one which is listed by Underwriters Laboratories



A. Heating Appliance, B. Heat Reclaimer, C. Vent Connector (to chimney), D. Metal Tubes, E. Fan, F. Electrical Supply. Schematic showing heat reclaimer and its location as installed on a furnace smokepipe

December 1979

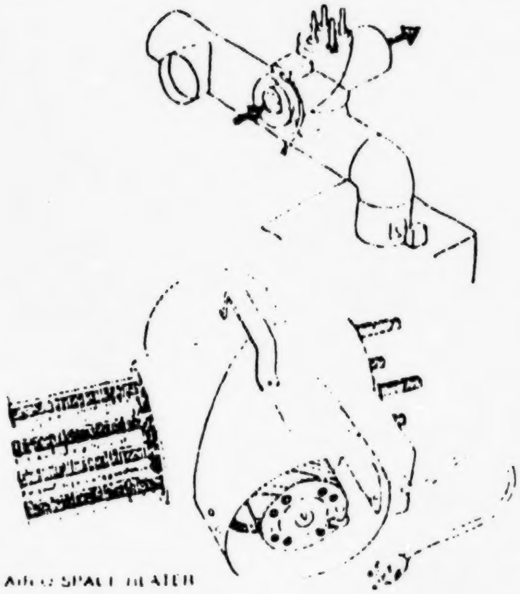
FUNCTION: A HEAT RECLAIMER ATTACHES TO THE BASE OF THE FURNACE FLUE AND REDIRECTS WARM AIR, WHICH OTHERWISE WOULD HAVE BEEN WASTED, BACK INTO THE HOUSE.

MANUFACTURER'S CLAIMS:

SAVINGS: 8% OF ANNUAL HEATING BILL.

COST: $140 INCLUDING INSTALLATION.

INSTALLATION: MUST BE INSTALLED BY A TRAINED EXPERT.



AIR-O SPACE HEATER

FUNCTION: A HEAT RECLAIMER ATTACHES TO THE BASE OF THE FURNACE FLUE AND REDIRECTS WARM AIR, WHICH OTHERWISE WOULD HAVE BEEN WASTED, BACK INTO THE HOUSE.

MANUFACTURER'S CLAIMS:

SAVINGS: 8% OF ANNUAL HEATING BILL.

COST: $140 INCLUDING INSTALLATION.

INSTALLATION: MUST BE INSTALLED BY A TRAINED EXPERT.

GAS SAVING DEVICE

WHAT IS IT?

A FUEL PRESSURE REGULATOR INSTALLED BETWEEN THE FUEL PUMP AND CARBURETOR.

Super Energy Cell

FUNCTION:	THE DEVICE LIMITS THE FUEL PRESSURE AND PREVENTS TOO MUCH GASOLINE FROM BEING PUMPED INTO THE CARBURETOR AT HIGH SPEED.

MANUFACTURER'S CLAIMS:

SAVINGS:	UP TO 25% LESS GASOLINE CONSUMPTION.
COST:	$7.
INSTALLATION:	REQUIRES CUTTING THE FUEL LINE.

WHAT IS IT?

AN ELECTRONIC IGNITION DEVICE, CONNECTED BETWEEN THE DISTRIBUTOR AND THE COIL, THAT STORES AND GENERATES ELECTRICAL ENERGY TO FIRE THE SPARK PLUGS.

Capacitive Discharge Ignition System

FUNCTION: A CAPACITIVE-DISCHARGE SYSTEM PROVIDES THE SAME AMOUNT OF ELECTRICAL ENERGY AT ALL ENGINE SPEEDS; A CONVENTIONAL IGNITION SYSTEM DELIVERS LESS ENERGY AT HIGH SPEEDS.

MANUFACTURER'S CLAIMS:

SAVINGS: 10% MORE GASOLINE MILEAGE.

COST: $30.

INSTALLATION: CAN BE INSTALLED BY PURCHASER.

ADDITIONAL INFORMATION

Based on Consumer Reports and Government Findings

1) FLUE DAMPERS--These devices are still in the testing stage in Canada. There are some problems with the devices which make them potentially more dangerous than is suitable.

2) FLUE HEAT RECOVERY DEVICE--Consumer Reports found it an effective means of recovering flue heat from an inefficient furnace. --It does need frequent cleaning (every 2 months) or a fire could result.

3) SUPER ENERGY CELL--Mileage improvements were not observed in tests.

4) LOW FLOW SHOWERHEADS--In tests body coverage and spray uniformity were judged adequate and spray was somewhat weak, but still acceptable, at low flow pressure.

5) SHOWER FLOW RESTRICTORS--In some cases it was found that restrictors reduced shower quality below acceptability.

6) SET BACK THERMOSTATS--In tests some thermostats have been unreliable --many not working long or well.

7) CAPACITIVE DISCHARGE IGNITION SYSTEM (Gas Saving Gadgets)--Mileage improvements not observed in tests. It might make spark plugs and distributor points last longer, but it would be a long time before these savings made up for the costs.

ATTRIBUTE QUESTIONNAIRE

	STRONGLY DISA	DISAGREE	NEUTRAL	AGREE	STRONGLY AGRE
1. This device seems easy to install.	1	2	3	4	5
2. This device should fit easily with my (car, furnace, shower, water heater).	1	2	3	4	5
3. The price of this device is too high for me to consider purchasing it.	1	2	3	4	5
4. Using this device would be inconvenient for my family.	1	2	3	4	5
5. This device appears too complicated.	1	2	3	4	5
6. This device costs too much for the amount of energy it can save.	1	2	3	4	5
7. I find it difficult to judge how useful this device would be because I cannot try it out in advance.	1	2	3	4	5
8. This device would soon pay for itself.	1	2	3	4	5
9. It would be difficult to explain the operation of this device to my friends.	1	2	3	4	5
10. The device appears to be priced reasonably given the claimed savings.	1	2	3	4	5
11. The inability to try this device prior to purchase would make me hesitant to buy it.	1	2	3	4	5
12. I doubt that this device could save the amount of energy claimed.	1	2	3	4	5
13. The use of this device might upset our daily household routine.	1	2	3	4	5
14. It would be hard to determine how much energy this device saves.	1	2	3	4	5
15. My friends would be interested in knowing about this device.	1	2	3	4	5
16. I understand how this device is supposed to work.	1	2	3	4	5

LIFESTYLE QUESTIONNAIRE

	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISA
1. Conserving energy will save you money in the long run.	1	2	3	4	5
2. I do volunteer work for a hospital or service organization on a fairly regular basis.	1	2	3	4	5
3. I think mechanical gadgets are fun.	1	2	3	4	5
4. It is against the law to make false claims in advertising.	1	2	3	4	5
5. Our family income is high enough to satisfy nearly all our important desires.	1	2	3	4	5
6. I turn lights off in my house whenever possible.	1	2	3	4	5
7. I often try new products before my friends and neighbours do.	1	2	3	4	5
8. By conserving energy in the home I feel I am a better citizen.	1	2	3	4	5
9. To buy anything other than a house or a car, on credit is unwise.	1	2	3	4	5
10. I sometimes influence what my friends buy.	1	2	3	4	5
11. There is not much the average citizen can do to save energy.	1	2	3	4	5
12. Five years from now our family income will probably be a lot higher than it is now.	1	2	3	4	5
13. My friends or neighbours often come to me for advice.	1	2	3	4	5
14. In my opinion we are facing energy shortages now.	1	2	3	4	5
15. I spend a lot of time talking with my friends about products and brands.	1	2	3	4	5
16. I think I have a lot of personal ability.	1	2	3	4	5
17. I think energy conserving devices are dependable.	1	2	3	4	5
18. I buy many things with a credit card or a charge card.	1	2	3	4	5
19. If I knew what to do I could save quite a bit on energy bills.	1	2	3	4	5
20. I am more independent than most people.	1	2	3	4	5
21. I like to try new and different things.	1	2	3	4	5
22. I like to be considered a leader.	1	2	3	4	5
23. I keep my thermostat lower than I did in past years.	1	2	3	4	5
24. I would not buy a major appliance unless it has a good					

26. People come to me more often than I go to them for information about products.	1	2	3	4	5
27. No matter how fast our income goes up, we never seem to get ahead.	1	2	3	4	5
28. By conserving energy at home I also help prevent pollution.	1	2	3	4	5
29. I find myself checking for prices in the store even for small items.	1	2	3	4	5

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30. I am a homebody.	1	2	3	4	5
31. I pay attention to energy efficiency ratings when shopping for appliances.	1	2	3	4	5
32. I will probably have more money to spend next year than I have now.	1	2	3	4	5
33. Most big companies are only out to make a profit.	1	2	3	4	5
34. I like to work on community projects.	1	2	3	4	5
35. I try to drive less now than in the past.	1	2	3	4	5
36. I wish we had a lot more money.	1	2	3	4	5
37. I like to pay cash for everything I buy.	1	2	3	4	5
38. I usually watch the advertisements for announcements of sales.	1	2	3	4	5
39. I enjoy buying mechanical gadgets.	1	2	3	4	5
40. I often seek out the advice of my friends regarding which product to buy.	1	2	3	4	5
41. I shop a lot for "specials".	1	2	3	4	5
42. A person can save a lot of money by shopping around for bargains.	1	2	3	4	5
43. In the winter, I turn my thermostat down at night.	1	2	3	4	5
44. I am an active member of more than one service organization.	1	2	3	4	5
45. It would be hard for me to cut down on the use of energy in my home.	1	2	3	4	5
46. It is good to have charge accounts.	1	2	3	4	5
47. My neighbours or friends usually give me good advice on what products to buy.	1	2	3	4	5
48. I like parties where there is lots of music and talk.	1	2	3	4	5
49. I would rather spend a quiet evening at home than go out to a party.	1	2	3	4	5

HOUSEHOLD CHARACTERISTICS

Please check the appropriate box.

1. Do you rent or own your own home?
   - ☐ Rent
   - ☐ Own/Paying off the mortgage

2. Excluding bathrooms how many rooms does your house have?
   - ☐ 3 or fewer
   - ☐ 4-5
   - ☐ 6-7
   - ☐ 8-9
   - ☐ 10 or more

3. Excluding basements and attics how many floors does your house have?
   - ☐ 1
   - ☐ 1½
   - ☐ 2
   - ☐ 3 or more

4. In which direction does your house face?
   - ☐ North
   - ☐ South
   - ☐ East
   - ☐ West

5. Which fuel is used most for heating your home? (check one)
   - ☐ natural gas
   - ☐ oil
   - ☐ propane
   - ☐ electric baseboard
   - ☐ electric furnace
   - ☐ other electric, e.g. hydronic, cable
   - ☐ wood
   - ☐ coal
   - ☐ other fuel (specify) ________________________

6. What type of water heater do you have in your home? (check one)
   - ☐ natural gas water heater
   - ☐ electric water heater
   - ☐ oil water heater
   - ☐ propane water heater
   - ☐ wood water heater
   - ☐ coal water heater

7. How many vehicles are used regularly by the members of your household?
   - ☐ none
   - ☐ 1
   - ☐ 2
   - ☐ 3 or more

8. Please try to estimate last year's total household bills for heating, electricity, and automobile gasoline and check the appropriate space for each.

Estimated Annual Bill	HEATING	ELECTRICITY	Automobile Gasoline Expense
Under $100			
$101-200			
$201-300			
$301-400			
$401-500			
$501-600			
$601-700			
$701-800			
$801-900			
$901-1000			
Over 1000			

9. How confident are you in the above estimates?
- ☐ very confident
- ☐ somewhat confident
- ☐ not very confident
- ☐ not confident at all

10. Which members of your household pay the monthly bills?
- ☐ yourself
- ☐ spouse
- ☐ other

11. Please indicate which of the following are used by your household by checking the appropriate boxes.

- ☐ clothes washer in your own home
- ☐ natural gas clothes dryer in your own home
- ☐ electric clothes dryer in your own home
- ☐ clothes washer at a laundromat
- ☐ clothes dryer at a laundromat
- ☐ dishwasher

- ☐ colour television
- ☐ black and white television
- ☐ remote control for the television
- ☐ video games for television
- ☐ computer chess game

- ☐ swimming pool heater
- ☐ vehicle engine block heater
- ☐ interior car warmer

- ☐ electric garage door opener
- ☐ electric toothbrush

- ☐ electric stove/range
- ☐ natural gas stove/range
- ☐ microwave oven
- ☐ frost free refrigerator
- ☐ manual defrost refrigerator
- ☐ freezer (separate from refrigerator)

- ☐ central air conditioner
- ☐ window air conditioner
- ☐ humidifier
- ☐ dehumidifier
- ☐ heat pump

- ☐ flue damper
- ☐ flue heat recovery device
- ☐ ram jet superchargers
- ☐ gas saving gadgets
- ☐ low flow shower head
- ☐ showflow restrictors
- ☐ set back thermostats
- ☐ energy conserving furnaces

12. How many people live in this household?
☐1
☐2
☐3
☐4-5
☐6-9
☐10 or more

13. How many children under the age of 18 live in this household?
☐0
☐1
☐2
☐3-4
☐5 or more

14. What is your present marital status?
☐never married (single)
☐now married
☐separated
☐divorced
☐widowed
☐other

15. In which of the following age groups do you fall?
☐under 18
☐18 to 24
☐25 to 34
☐35 to 44
☐45 to 54
☐55 to 64
☐65 and over

16. Sex:
☐male
☐female

17. Highest level of education completed.
☐less than 5 years
☐5-8 years
☐9-10 years
☐11-13 years
☐Vocational/technical/college
☐some university
☐graduated university

18. Are you currently:
☐employed
☐unemployed
☐retired
☐housewife
☐student
☐other (please specify) ________________

19. What was your total combined household income from all sources in 1980?
☐Under $5,000
☐$5,000-9,000
☐$10,000-14,999
☐$15,000-19,999
☐$20,000-24,999
☐$25,000-29,999
☐$30,000-34,999
☐$35,000-39,999
☐$40,000-44,999
☐$45,000-49,999
☐Over $50,000

TABLE 9.2

PERCEPTIONS OF FLUE HEAT RECOVERY DEVICES RATINGS OF ATTRIBUTES (DIFFUSION FACTORS)

	Average Ratings by Level of Product Interest			
	No Interest	Ambivalent Interest	Positive Interest	F-Value
Number of Respondents	155	191	56	
Relative Advantage Attributes[1]				
"This device would soon pay for itself."	2.79	3.34	3.50	25.00**
"I doubt this device could save the amount of energy claimed." (reverse scored)	2.87	3.08	3.41	8.67**
"It would be hard to determine how much energy this device saves." (reverse scored)	2.60	2.66	2.86	1.53
"This device appears to be priced reasonably, given the claimed savings."	2.93	3.34	3.68	16.86**
"This device costs too much for the amount of energy it can save." (reverse scored)	2.81	3.21	3.59	17.66**
"The price of this device is too high for me to consider purchasing it." (reverse scored)	2.69	3.07	3.44	14.96**
"This device seems easy to install."	2.66	2.64	2.70	0.06
"This device should fit easily with my (car, furnace, shower, water heater)."	3.17	3.44	3.88	13.78**

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[1] All attributes were scored such that the higher the average, the more positive the product perception.

** Statistically significant at $\alpha < .05$